TECHNOLOGY DEPT.

the OIL AND GAS JOURNAL

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You can't get better dehydrating reagents — no one can give you better service. If you have other production problems, ask about THESE Tretolite products:

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PRICE 50 CENTS TABLE OF CONTENTS PAGE 49 **DECEMBER 14, 1950**

XUM

Wyatt fabricated products
at work for industry
on the Texas Gulf Coast
Wyatt's
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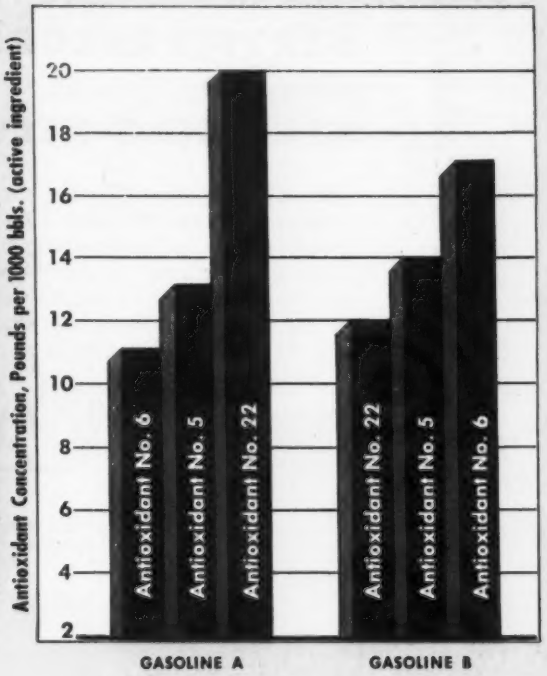
XUM

XUM

Field Laboratories will evaluate Du Pont Gasoline Antioxidants for refiners.



Comparative antioxidant concentration, pounds per 1000 bbls. (active ingredient) needed to attain an induction period of 400 minutes.

Which of the Three Du Pont Antioxidants Is Most Economical in Your Gasoline?

If you have not checked the antioxidant responsiveness of your gasoline to *all three* Du Pont Antioxidants you may be paying a good deal more for antioxidant treatment than you need to. To meet variations in response of various gasolines, Du Pont offers *three* Gasoline Antioxidants . . . Nos. 5, 6, and 22.

A test with your gasoline, which you can perform in your own laboratory, or which we will be glad to make in the nearest District Laboratory, may reveal that one of the three antioxidants is considerably more economical to use. The bar charts above, made from actual laboratory tests, show the savings effected in two different gasolines.

Test requirements and methods of handling may also affect your choice of antioxidants. Antioxidant No. 6 usually provides the most economical control wherever copper dish gum specification is of importance. Where water extraction by tank bottoms or in pipelines is a problem, Antioxidant No. 22, with a low water solubility, is generally best.

For samples, or for an evaluation of your gasoline, ask your Du Pont Petroleum Chemicals Representative or write the nearest District Office.

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Better Things For Better Living
...Through Chemistry

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Make Du Pont the Source for All of Your Gasoline Additives ... Tetraethyl Lead Compounds (Motor Mix—Aviation Mix)—Antioxidants—Metal Deactivator—Dyes

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The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1950

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SERVICE RECORD — *Outstanding!*

SERVICING RECORD — — — *ditto!*

This Fairbanks-Morse ZC Engine boasts a remarkable record. After 10 years of operation, it is still going strong *with no overhaul required.* It ran 24 hours a day for 6 years and 12 hours a day for 2 years. Engine upkeep has amounted only to routine valve grinding. Crank case oil was changed every 30 days.

This record for service and *servicing* is typical of the Fairbanks-Morse ZC . . . is one of the reasons why they are the oil field favorites. See them at your supply store or write Fairbanks, Morse & Co., Chicago 5, Ill.

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a name worth remembering

OIL FIELD EQUIPMENT • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • SCALES • HOME WATER SERVICE AND HEATING EQUIPMENT • RAIL CARS • FARM MACHINERY

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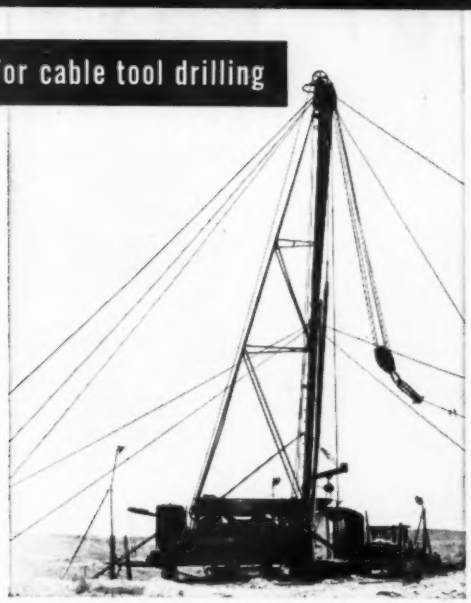
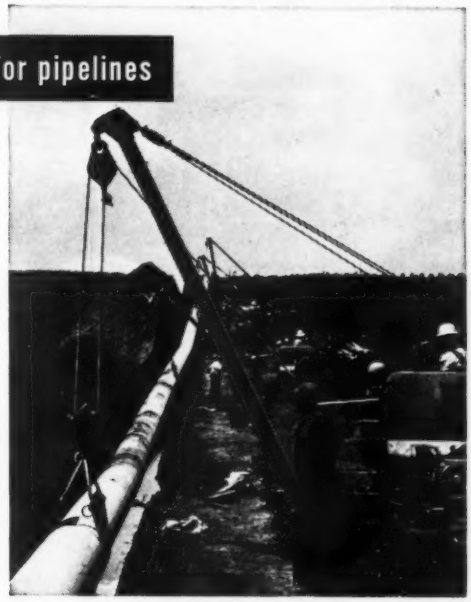
For rotary drilling

For cable tool drilling



For well servicing

For pipelines



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Because your equipment is designed specially for the work you are doing, you'll get the best service by using wire rope *specially designed* for your equipment.

From the thousand and one wire ropes made by Macwhyte, you're sure to get the wire line specially designed for and suited to your needs.

The specialized experience of Macwhyte engineers is yours for the asking—to get recommendations for all your needs, just call a Macwhyte distributor or write Macwhyte Company.

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605-O

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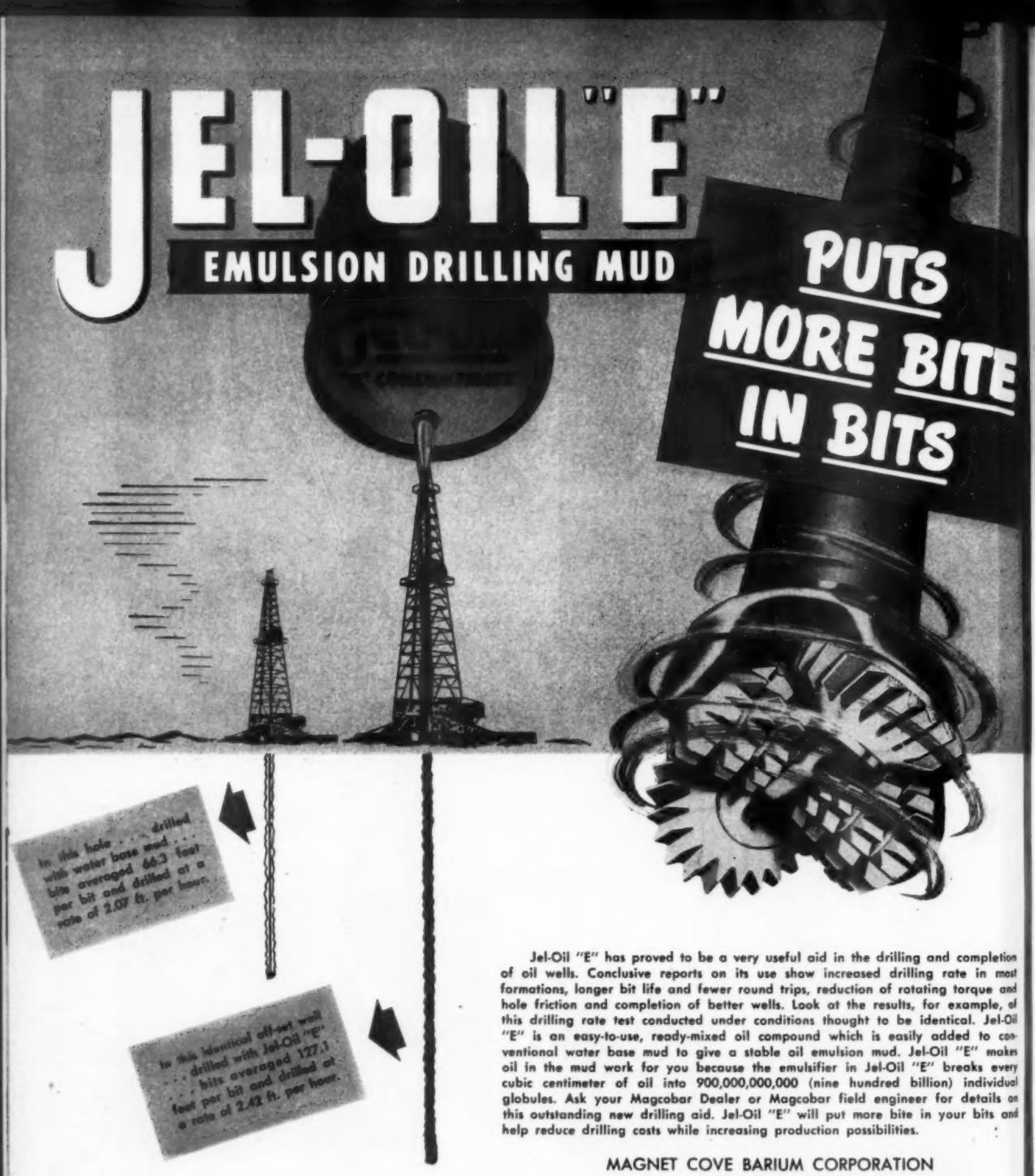
JEL-OIL "E"

EMULSION DRILLING MUD

PUTS MORE BITE IN BITS


In this hole . . . drilled with water base mud . . . bits averaged 66.3 feet per bit and drilled at a rate of 2.07 ft. per hour.
In this identical off-set well . . . drilled with Jel-Oil "E" . . . bits averaged 127.1 feet per bit and drilled at a rate of 2.42 ft. per hour.

Jel-Oil "E" has proved to be a very useful aid in the drilling and completion of oil wells. Conclusive reports on its use show increased drilling rate in most formations, longer bit life and fewer round trips, reduction of rotating torque and hole friction and completion of better wells. Look at the results, for example, of this drilling rate test conducted under conditions thought to be identical. Jel-Oil "E" is an easy-to-use, ready-mixed oil compound which is easily added to conventional water base mud to give a stable oil emulsion mud. Jel-Oil "E" makes oil in the mud work for you because the emulsifier in Jel-Oil "E" breaks every cubic centimeter of oil into 900,000,000,000 (nine hundred billion) individual globules. Ask your Magcobar Dealer or Magcobar field engineer for details on this outstanding new drilling aid. Jel-Oil "E" will put more bite in your bits and help reduce drilling costs while increasing production possibilities.

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. . . on IDECO'S Hydrair 7-11 Rig

The 7-11 rig, using three engines with a total of 1050 H.P., has demonstrated in extensive, varied service that it will make hole rapidly and economically.

The combination of three efficient and reliable elements in this rig provides a machine that is hard to beat from any angle—cost of making hole, crew satisfaction or long life with low maintenance. These three vital elements are:

Torque Converters, which provide high torque for starting lift and maximum applied horsepower for all hook loads.

Air Controls—simple, fast and effortless, and

LINK-BELT ROLLER CHAINS, which are sturdy, trouble-free and positive, yet flexible.

Our engineers will be glad to assist you on any power transmission problem. Just phone or write us—there's no obligation.

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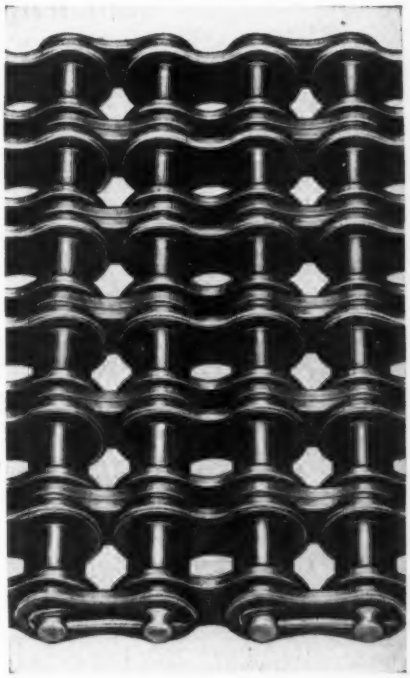
Precision Steel

ROLLER CHAIN



Link-Belt Precision Steel Oil Field Roller Chains available in widths varying from single to sextuple are packed in dust-proof fiber boxes for easy handling and labeled for quick identification.

ANNOUNCING...

The Western plant and facilities
of W. C. HARDESTY CO., INC.
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Vegetable Oil Products Company, Inc.,
and will operate as

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The fatty acids and specialty products manufactured by this plant will be marketed under the new distinctive trade name VOPCOLENE. *We invite you to write for a brochure describing properties of these* VOPCOLENE *products.*

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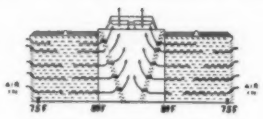
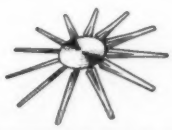
OPEN DISTRIBUTION SYSTEM

Double-Flows always operate at top efficiency because the water distribution system is available. Water flow to each cell is easily regulated . . . cleaning, a matter of minutes.



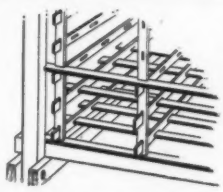
COLDER WATER

Water falling near the louvered side walls is at near wet bulb temperature. Only Double-Flow, with its cross-flow design, can give this extra-cold water.



MULTIBLADED FANS

Vibration and "rough operation" caused by air pulsations are prevented by the use of multibladed fans. These large rugged, multibladed fans insure longer tower life.



NAIL-LESS FILLING

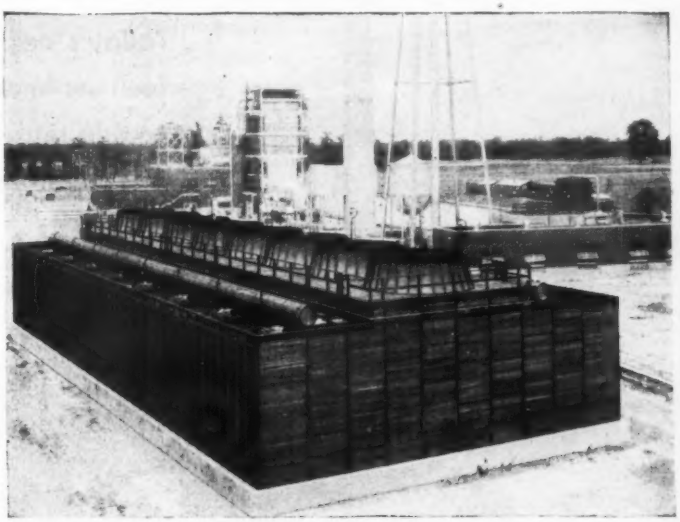
No warped, twisted or sagged filling because filling members are free to expand and contract in a definite pattern. This nail-less filling has been field-proven during the past decade.

NO AIR CHANNELING

No "dead spots" caused by air streaming from small louvered openings to the fan. Full height louvered walls assure intimate air-water contact in all parts of the cooling chamber.

At No Extra Price

On The Marley Double-Flow



AND, that's not all . . . you also get rugged Marley Geareducers, heart quality redwood lumber, ring connectors, more square feet of drift eliminators, more wetted surface per cubic feet, regulator valves on each cell, bolted compression-system diagonals with full bearing at each end, no nozzle pressure required, less pumping head, walkways, shiplap double wall casing and many other features.

Marley research and development is continually at work bringing out new ideas—setting a higher standard for the cooling tower industry.

Get these important features on your next cooling tower. They are standard on the Marley Double-Flow . . . *at no extra price.*

MAIL THIS COUPON TODAY

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OG12

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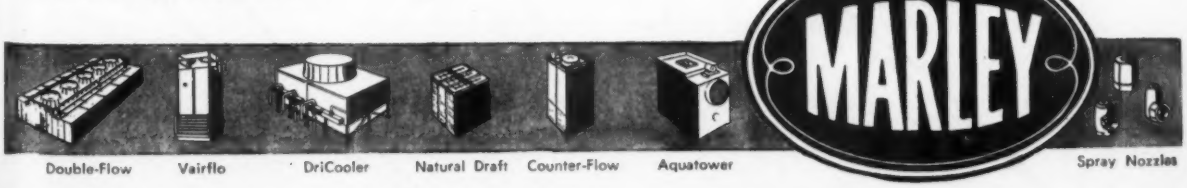
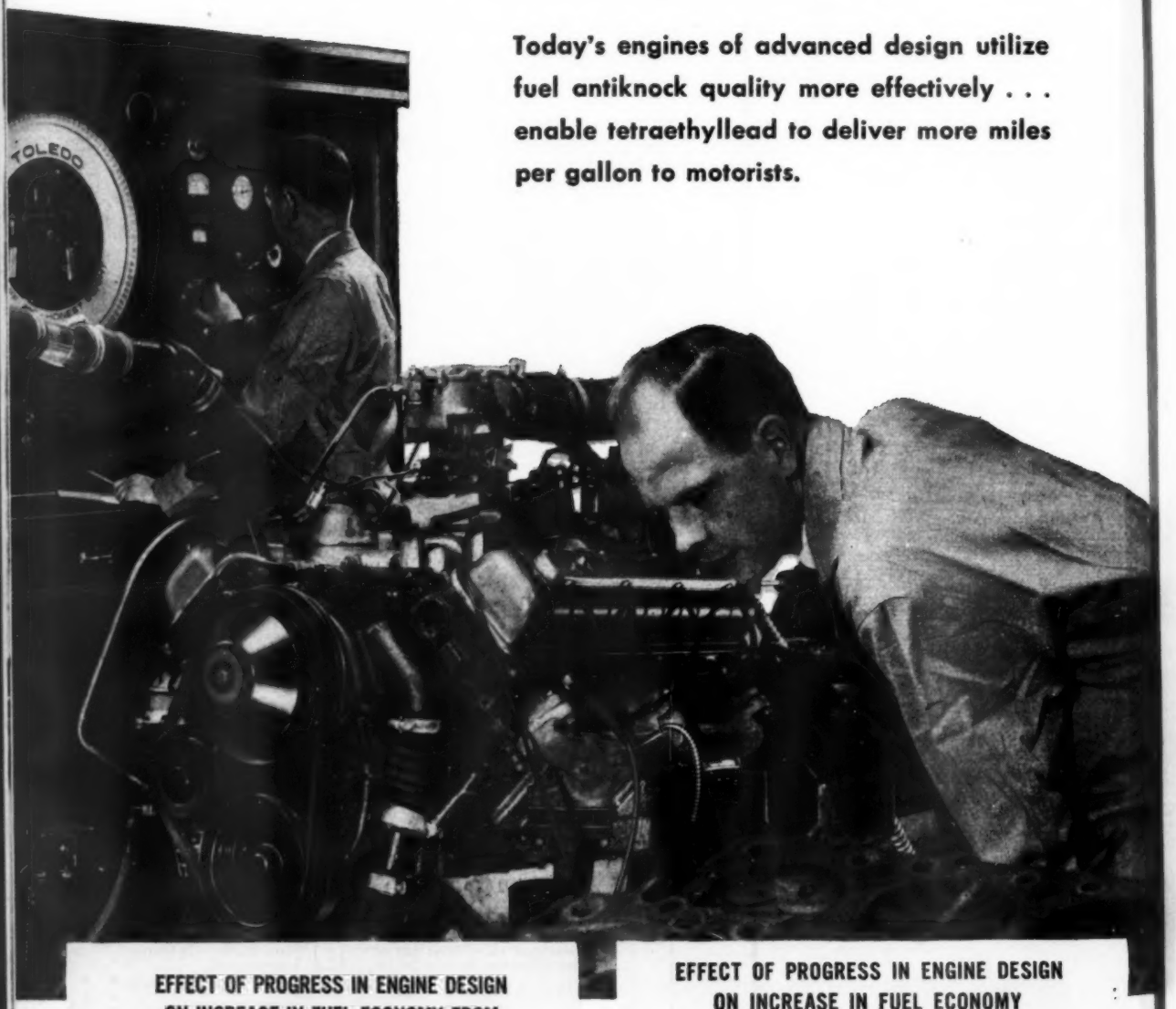


Value of "lead" to refiners increased by modern engine design

Today's engines of advanced design utilize fuel antiknock quality more effectively . . . enable tetraethyllead to deliver more miles per gallon to motorists.



EFFECT OF PROGRESS IN ENGINE DESIGN ON INCREASE IN FUEL ECONOMY FROM HIGHER COMPRESSION RATIOS

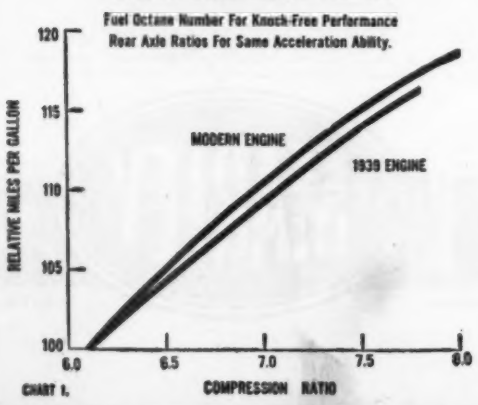


CHART 1.

EFFECT OF PROGRESS IN ENGINE DESIGN ON INCREASE IN FUEL ECONOMY FROM BETTER GASOLINES

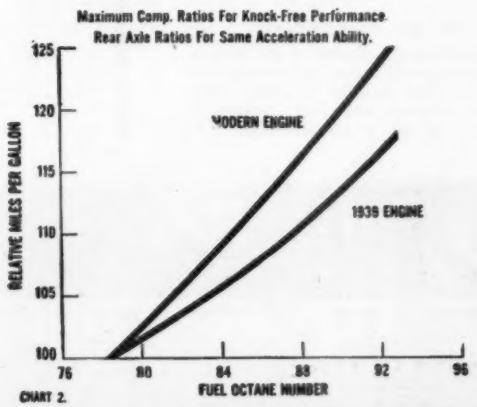


CHART 2.

IT IS A FACT that "two gallons of today's gasoline will do the work of three gallons of 1925 gasoline." Since tetraethyllead was first marketed more than twenty-seven years ago, tremendous advances have been made in the gasoline refining and automotive engine design. It now appears that as gasoline and engines are further improved, tetraethyllead will become even more valuable to the refiner, the engine designer and the motorist.

Comparison of a 1939 engine and modern engine, both representative of the best design for each period, indicates that more effective use of octane numbers is being made today. In the Ethyl Laboratories extensive dynamometer data relating to engine performance and fuel antiknock quality were obtained on both engines. Later the engines were installed in cars so that complete data could be obtained on the road.

Modern design gives 10% improvement

When fuel of 78.3 octane number with proper compression ratio was used, the maximum brake mean effective pressure at 1000 revolutions was 104.3 lb. per square inch for the 1939 engine and 114.5 for the modern engine. Gasoline consumed per hour in the development of one horsepower at 1000 RPM and a throttle setting corresponding to a level-road speed of 20 MPH was 1.08 lb. for the 1939 engine and 0.91 lb. for the modern engine.

If the modern engine had been installed in the 1939 automobile and had been operated at the proper compression ratio for 78.3 octane gasoline, the acceleration and hill-climbing performance of the car would have been about 10% better and gasoline economy improved at least 10%. Obviously the modern engine makes more efficient use of gasolines having antiknock quality typical of the late prewar period.

Better use of TEL at higher compression ratios

The charts compare the improvement in gasoline economy of the two engines as the compression ratio was increased to take advantage of the better fuels marketed since 1939. Chart 1 shows the relative fuel economy as the compression ratio was increased from 6.1. The actual fuel economy of the modern engine at 6.1 compression ratio was better than that of the 1939 engine; however, as two different automobiles were used, the road fuel economy of each engine at 6.1 compression ratio has been arbitrarily established at a relative value of 100. The divergence of the curves indicates that the modern engine had about 11% greater rate of improvement in gasoline mileage as compression ratio was increased.

In the utilization of "chemical octane numbers," the modern engine is far superior. In addition to the aforementioned larger gain in economy *per compression ratio*, the modern engine permitted a considerably greater increase in compression ratio *per octane number*. The combined effect of these two advantages is indicated in Chart 2 which shows the relative percentage increase in gasoline economy of the same two engines on the road when the compression ratio was increased from that permissible with fuel of 78.3 octane number to that suitable for 92.8 octane fuel, at constant acceleration ability. The improvement for the 1939 engine was about 18%, whereas that for the modern engine was 25%, or 39% greater.

The more effective use of fuel antiknock quality by modern engines of advanced design enables tetraethyllead to deliver far greater benefits. This is shown in Chart 3, in which road-test data show that 3.0 cc tetraethyllead added to an average base stock for 1949 premium gasoline permits an increase in the compression ratio of the 1939 car which yields 12.3% gain in fuel economy. In the modern engine, the same amount of tetraethyllead yields 18.4% increase in fuel economy. Thus, in the modern engine, tetraethyllead is worth about 50% more on the basis of gasoline economy . . . and as engines are further improved, it will be worth more and more to the refiner seeking to give the public an ever-increasing value.

EFFECT OF PROGRESS IN ENGINE DESIGN ON INCREASE IN FUEL ECONOMY FROM TETRAETHYLLEAD ADDED TO AVERAGE BASE FOR PREMIUM GASOLINE

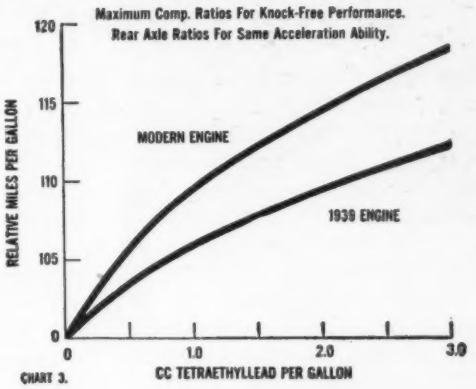
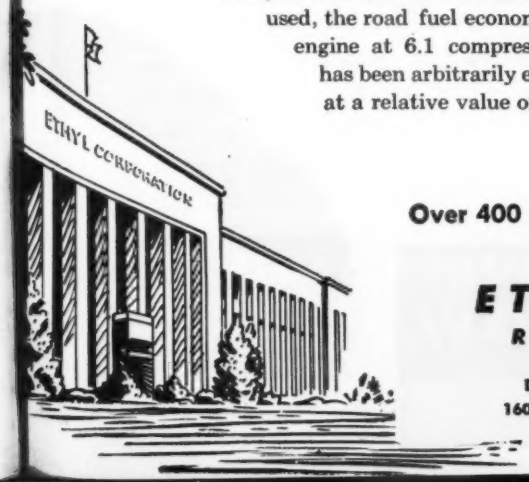


CHART 3.



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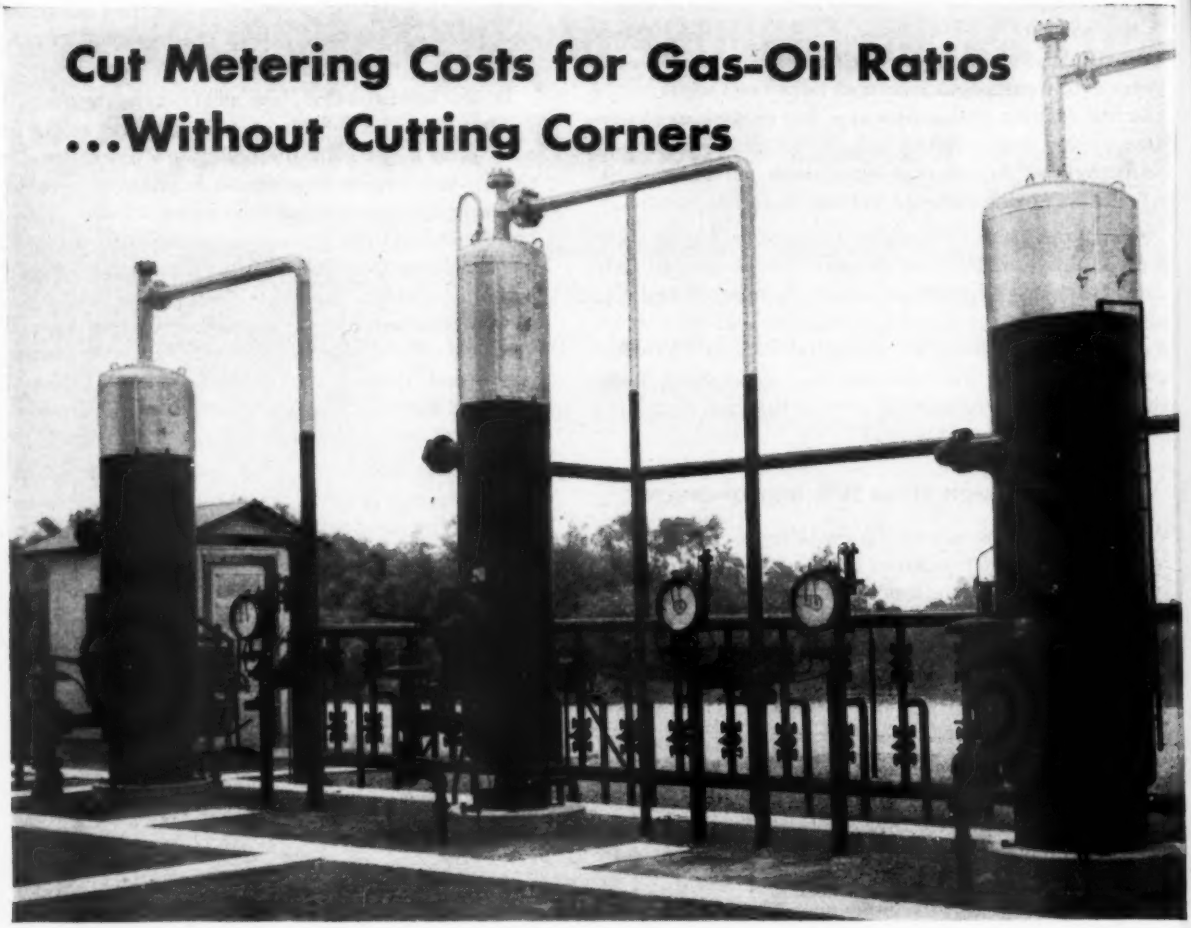


Measuring gas from Separator Batteries at Conoco Driscol Field, Benavides, Texas with 3 Foxboro Gas Flow Meters Type 4.

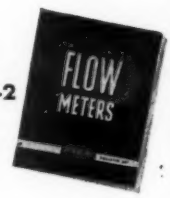
HERE'S THE WAY IT'S DONE

By taking advantage of the exclusive features built into Foxboro Flow Meters, you can cut meter inspection trips and recalibration to the bone . . . *and eliminate mercury losses completely.* You won't need to coddle these meters to get accurate records.

Foxboro Flow Meters are designed with a *unique straight-line linkage* that makes factory adjustments permanent. Their sustained accuracy is outstanding. Four to six years' service without recalibration isn't uncommon! In addition, floats of Foxboro Meters are *extra large* and have *extra long* travel. This means unequalled *power* . . . giving highest accuracy at the pen. *Sure-Seal Check Valves,* submerged in mercury, positively prevent mercury losses. And for freedom from friction and freeze-ups, Foxboro Pressur-Tite Bearings have never been equalled!

These are the reasons why experienced production men prefer Foxboro Flow Meters above all others . . . why you can cut metering costs without jeopardizing the accuracy of your records.

WRITE FOR Bulletin 351-2 for complete details.



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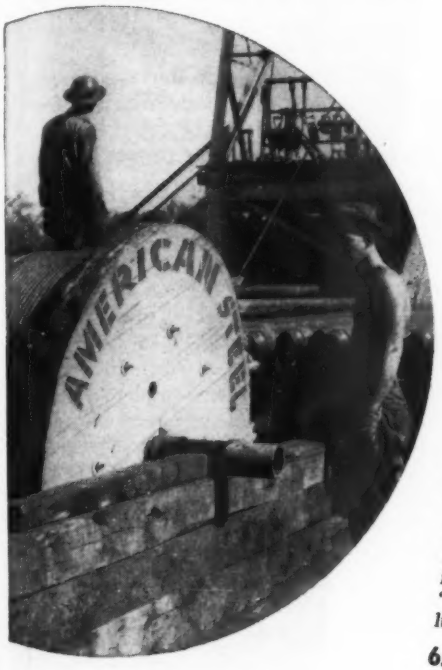
MONEY-SAVING FLOW METERS

Take care of your wire rope



Here are a few simple rules that will prolong its life

1. Select wire lines of the correct size, construction and grade for your particular conditions.

2. Buy it *long* enough to permit a number of changes in position on the drum.

3. Do not overload the rope. Determine your maximum loads and follow the recommended factor of safety. No rope can survive overloading.

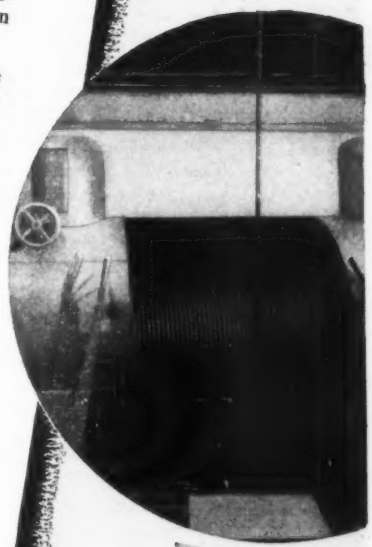
4. Check sheaves regularly to be sure the grooves are not undersized. All sheaves should be properly lubricated and in line.

5. Keep your wire ropes well lubricated. American Tiger Lube was designed especially for wire rope lubrication. It does not "throw" in hot weather and it retains its lubricating qualities in the coldest weather.

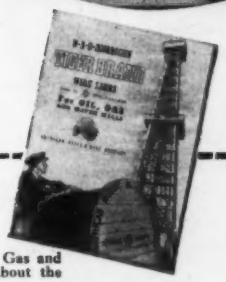
6. Avoid sudden jerks. Running into the load instead of picking it up smoothly puts an undue strain on the rope structure.

7. Avoid kinks, uneven spooling on drums and reverse bends.

8. Don't speed. Sudden acceleration and deceleration may cause whipping and uneven spooling on the drum. High speeds cause excessive wear.



USS AMERICAN TIGER BRAND WIRE ROPE UNITED STATES STEEL



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UNITED STATES STEEL

Carilloy "T" Steel greatly

ON THE MARION 5561 — WORLD'S LARGEST POWER SHOVEL

THE mammoth 45 cubic yard bucket on Hanna's "Groundhog" is moving more than a million yards of overburden every month. Despite the exceptional punishment it receives, the U·S·S CARILLOY T-Steel lip-plate has already been in service much longer than any steel previously used.

Further, the higher physical properties of T-Steel have made possible design changes which are now under way and which should greatly extend lip life beyond present construction.

Here's what Hanna Coal Company says, as owner and operator, "The lip of this bucket (made from 4½" CARILLOY T-Steel) is one of the most critical sections and it takes a great deal of punishment when loading the rock strata we have at this location. At Marion Power Shovel Co., we have a *50-yard* bucket on order. It will be built almost entirely of T-Steel . . ."

In this new bucket, CARILLOY T-Steel will increase capacity 5 yards — almost *9 tons* — by cutting weight without any sacrifice in strength. And because it can be welded *in the field*, T-Steel construction makes it unnecessary to shut the shovel down for the many hours formerly required for shop repairs.

CARILLOY T-Steel, a product of United States Steel research, is a *low carbon* alloy steel, heat-treated with great precision. Minimum yield strength is 100,000 psi (for plates ¼" to 2" inc.) Furthermore, T-Steel will remain ductile at arctic temperatures—*even after welding.*

Welding does not lower the strength of the plate. If AWS electrodes E-12015 or E-12016 are used, welds remain 100% strong . . . both butt and fillet-welded specimens will break completely outside of the heat-affected area. As for toughness, laboratory tests have proved that, even after gas-cutting, T-Steel can be bent at more than 100°F. below zero.

CARILLOY T-Steel is normally produced in the forms of plates and bars. Nominal hardness is 250 Brinell, although 321 minimum Brinell can be furnished for abrasive conditions where a combination of high hardness, toughness and weldability is essential.

increases lip-plate life

MECHANICAL PROPERTIES—U·S·S Carilloy T-1 Steel Plates can be furnished Heat Treated to the following mechanical properties:

	Thickness ¼" to 2" incl.	Thickness Over 2" to 4" incl.	Thickness Over 4" to 6" incl.
Yield Strength, 2% Offset (min.)	100,000 psi	90,000 psi	90,000 psi
Tensile Strength (min.)	115,000 psi	105,000 psi	105,000 psi
Elongation in 2", % (min.)	18	17	16
Reduction of Area, % (min.)	55	50	45
	Thickness ¼" to ½" incl.	Thickness Over ½" to 1" incl.	Thickness Over 1" to 2" incl.
Cold Bend	180°D=1t	180°D=2t	180°D=3t

(Testing in accord with A.S.T.M. recommended practices.)

CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH

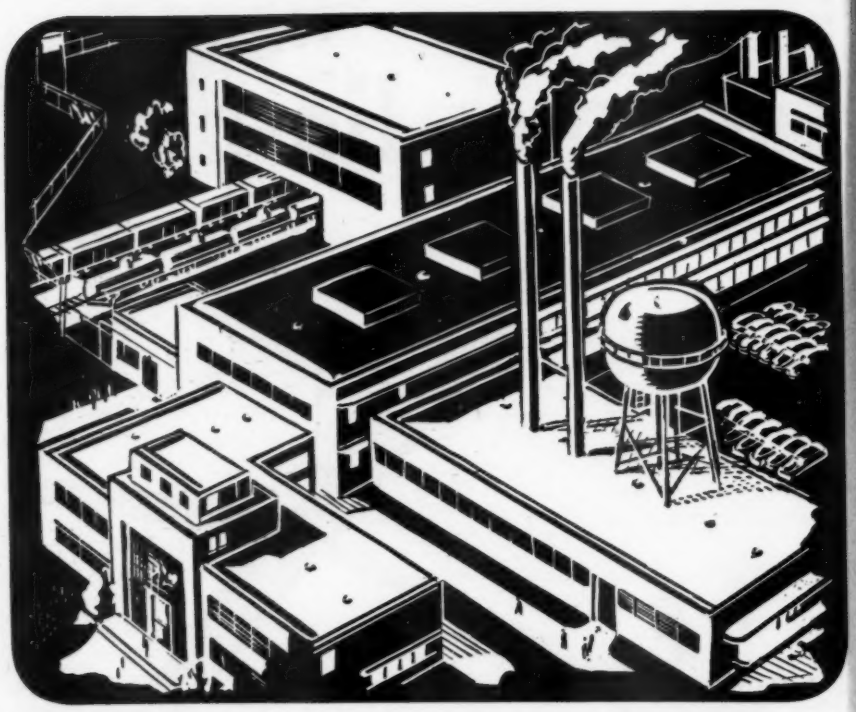
COLUMBIA STEEL COMPANY, SAN FRANCISCO • TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM

UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **Carilloy Steels**

ELECTRIC FURNACE OR OPEN HEARTH • COMPLETE PRODUCTION FACILITIES IN CHICAGO AND PITTSBURGH

UNITED STATES STEEL



An overwhelming percentage of the Nation's largest Industrial plants obtain their water supply from Layne-built wells and pumps.

It is true that LAYNE LIKES COMPETITION!

Competition has been responsible for making Layne the world's best known builder of Well Water Systems and high efficiency Vertical Turbine Pumps. It was the low production and short life of competitive wells that caused Layne to originate the famous underreamed gravel wall well;—the invention and building of horizontal louver sand screen and the innovation of scientific well drilling under full and accurate control at all times. Competition also caused Layne to design and build the finest Vertical Turbine Pumps ever offered to cities, factories and irrigation farmers.

Competition has been a delightful companion to Layne for years and years, and best of all it has been a wonderful guide in showing hundreds of things NOT TO DO in building dependable well water systems.

Layne offers all industries, cities and users of ground water in big quantities, a wholesome record of fine service not equaled by any other well drilling or pump building firm in the entire world. No other organization can match Layne's record of dependability in their chosen field.

● LAYNE OFFERS a wide range of fully illustrated catalogs and folders describing Layne Well Water Systems, Oil and Water Lubricated Vertical Turbine Pumps, Short Coupled Service Pumps, Cemented Wells, Screens for Gravel Wall Wells, Irrigation Pumps, etc. Write for your copy. No obligation.

For further information, catalogs, etc., address

LAYNE & BOWLER, INC.

General Offices, Memphis, Tenn.

LAYNE ASSOCIATED COMPANIES

ASSOCIATED COMPANIES—Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka, Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Pacific, Inc., Seattle, Wash. ★ The Layne-Texas Co., Ltd., Houston, Tex. ★ Layne-Western Co., Kansas City, Mo. ★ Layne-Minnesota Co., Minneapolis, Minn. ★ International Water Corp., Pittsburgh, Pa. ★ International Water Supply, Ltd., London, Ont. ★ Layne-Hispano Americana, S.A., Mexico, D. F. ★ General Filter Company, Ames, Iowa.

LAYNE

WELL WATER SYSTEMS

VERTICAL *Turbine* PUMPS

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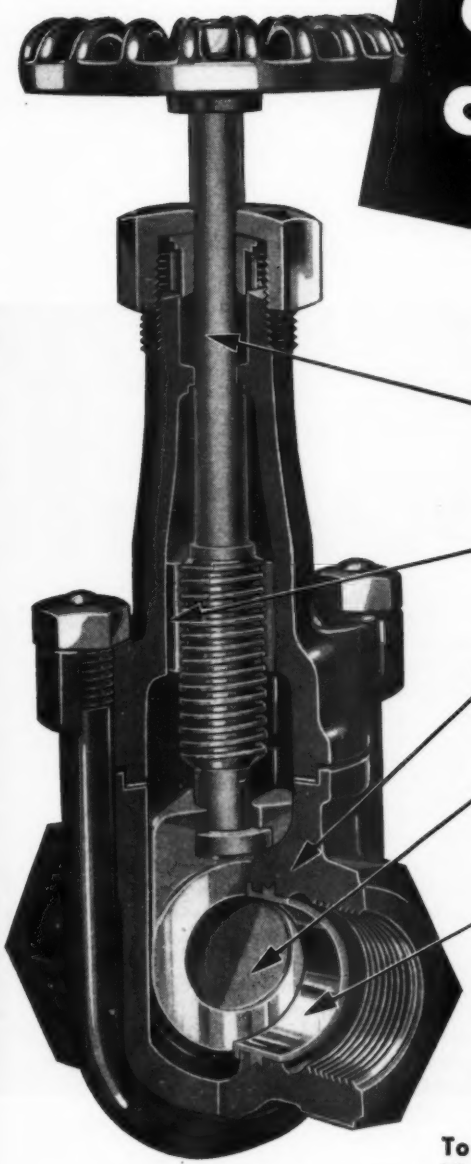
ONLY THESE CLIP GATES GIVE YOU THIS COMBINATION



★ **STEM LIFE INCREASED 20 TO 30 TIMES** Valve stems of the new OIC Alloy 40 offer greatest resistance to corrosion, wear and galling; no seizing.

★ This special, extra large duct permits complete drainage of the bonnet and prevents damage by freezing.

★ Thick, scientifically designed walls make OIC Valves strong and sturdy. No distortion.

★ Wide wedge prevents warping and allows plenty of space for accurate seating. OIC Clip Gates pass rigid air tests; no oil or wax on seating surfaces to hide leakers.

★ *Exclusive in OIC Clip Gates, 2" and under:* Seats are cast in place and then rolled to make *doubly sure* they are tight and secure. Greatly superior to simply rolling in against machined surfaces.

To be certain of the best, ask for OIC Clip Gates.
The Ohio Injector Company, Wadsworth, Ohio.

OIC
FOUNDED 1883

VALVES

FORGED AND CAST STEEL · IRON · BRONZE

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BOARD of DIRECTORS
meeting on a machine screw

Sounds like an exaggeration, doesn't it? But it's not so far-fetched when you consider that this machine screw symbolizes a whole group of fastenings that have been failing in service because of corrosion.

More or less, this happens every day in American industry. A small bolt or screw or rivet, that was never designed for use under corrosive conditions, gives way—and the whole machine, or process, grinds to a stop.

The only way to keep out of this picture is to make sure that the fastenings you use are non-ferrous or stainless steel.

Harper specializes in these Everlasting Fastenings; makes them in over 7000 different sizes, types and alloys—Brass, Bronzes, Copper, Monel and Stainless Steels; maintains large quantities in stock, ready for immediate delivery from distributors and warehouses located in principal cities.

If rust and corrosion resistance is important to you . . . if you can see the real economy in replacing common steel with fastenings that are non-magnetic, longer-lasting, reusable . . . write today for our catalog and current stock list: The H. M. Harper Company, 8208 Lehigh Avenue, Morton Grove, Ill.

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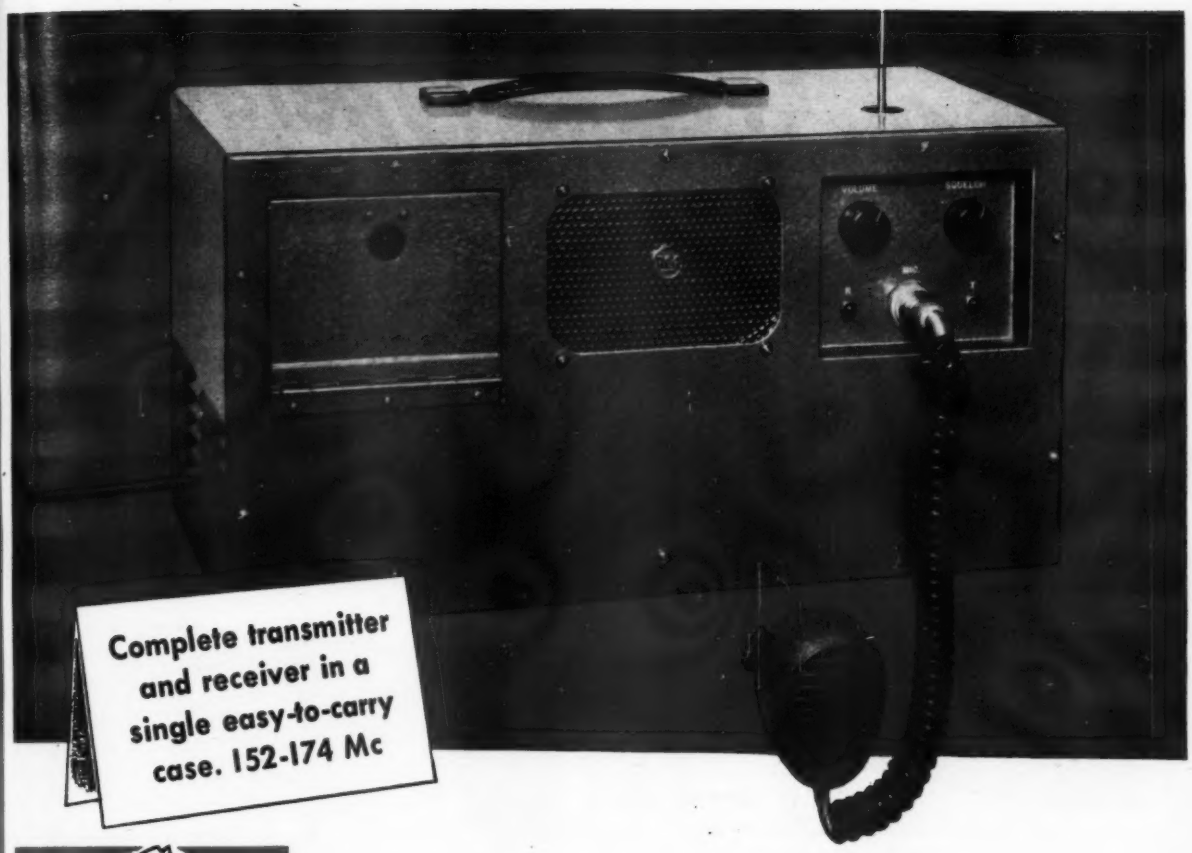
AMERICA'S LEADING SPECIALISTS IN NON-FERROUS AND STAINLESS STEEL FASTENINGS

EVERLASTING FASTENINGS



IT'S EASY TO CARRY—weighs only 44 pounds. The case is only 19⅜" long, 10¾" high, and 9¼" deep.

IT CAN BE SET UP ANY PLACE where there's a 115-volt, a-c supply—for taxis, forestry, utilities, construction projects.

IT'S IDEAL for 2-way operation (police, fire, etc.) in small and medium-size municipalities requiring medium-range communication equipment.

For *portable or fixed* station use

. . . the RCA Carfone Station Unit "15"

THIS is the most versatile 2-way radio station ever designed for medium-range communication. It is complete with transmitter, receiver, power supply, portable antenna, handy microphone, and loud speaker—*all in a single package.*

Easy to carry and easy to set up, this portable unit can be operated wherever there is a 115-volt, a-c outlet.

For fixed station use, place the unit on the operating desk, hook-up the antenna, plug in the power cord, and you're set to go. For portable station use, simply connect the quarter-wave, whip antenna (supplied) and plug in the power cord. No extra components to carry around. No installation expense involved.

Greatly improved receiver selectivity reduces adjacent channel signals well below interference levels. A newly-designed transmitter modulation control enables you to transmit the full signal potential of the transmitter and maintain 100 per cent modulation at virtually all voice levels—*whether you shout or whisper into the microphone.*

For complete information on the new RCA Carfone Station Unit "15", write Dept. 122L, RCA Engineering Products, Camden, New Jersey.

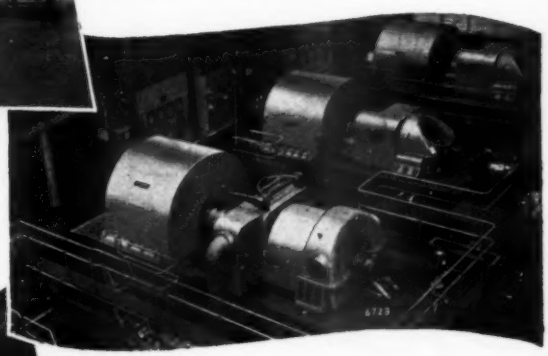
MOBILE COMMUNICATIONS SECTION
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

for Continuous Operation specify De Laval heavy Duty Blowers!

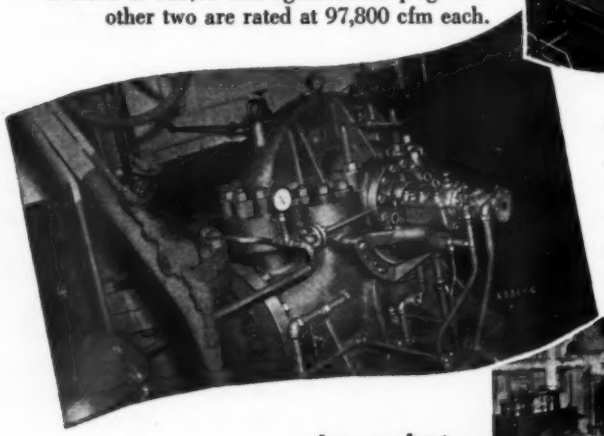
In refineries

This 1910 hp, 17,800 cfm De Laval Turbine Driven Blower supplies air for catalyst regeneration in a fluid catalytic cracking plant.



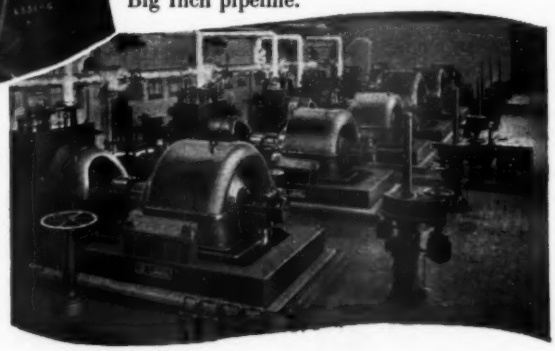
In steel plants

These three De Laval Blast Furnace Blowers serve one of America's leading steel plants—the largest unit is rated at 123,00 cfm against 33.3 psig. The other two are rated at 97,800 cfm each.



On pipe line service

This De Laval single-stage compressor pumps gas through the Little Inch pipeline at 850 psi. Similar De Laval units also are giving continuous trouble-free service at this high pressure on the Big Inch pipeline.



In gas plants

Three De Laval coke oven boosters and three coke oven exhausters installed in an Eastern Steel Mill. Send for catalog 05-C16-OG.

DE LAVAL STEAM TURBINE CO.

TRENTON 2, N. J.

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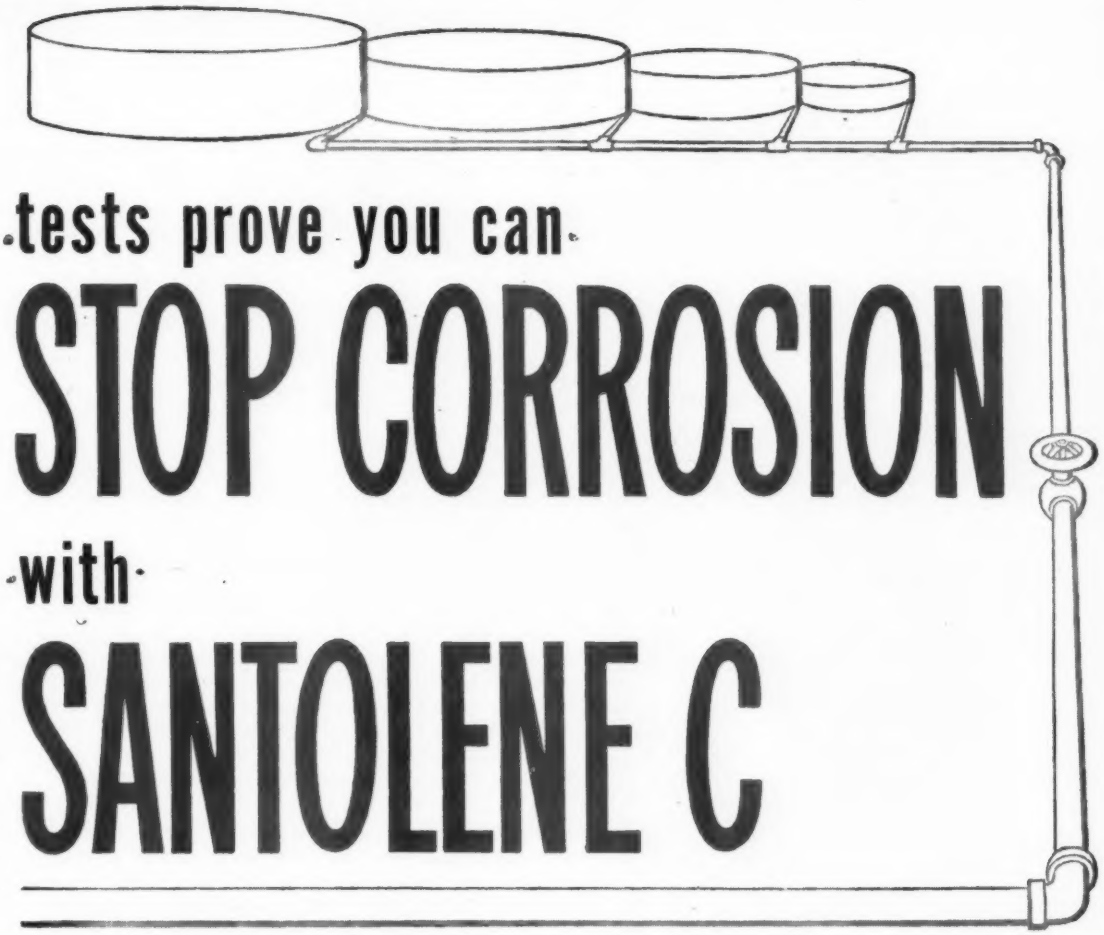

tests prove you can STOP CORROSION with SANTOLENE C

If corrosion in pipelines, tanks and equipment handling light petroleum products is one of *your* problems, you can solve it with Monsanto Santolene C.

Static storage experiments with both gasoline and fuel oil show results that are *positive proof* that Santolene C stops corrosion. Static storage is a severe test of a corrosion inhibitor such as Santolene C.

Fuel Oil, containing as little as 100 parts per million of Santolene C, stored in steel drums for months, left the containers free of corrosion . . . free of pitting. Drums, without Santolene C, holding fuel oil from the same lot and stored under identical conditions for the same period, were badly pitted by corrosion.

Gasoline, with as little as 20 parts per million of Santolene C, left steel drums smooth and bright after months of storage. The same kind of drums, holding identical gasoline without Santolene C, were badly damaged by corrosion.

Put Santolene C in your gasoline and fuel oil and take out the corrosion problem. Monsanto Santolene C stops corrosion . . . quickly . . . positively . . . economically. For information, mail the coupon or write: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1745-L South Second Street, St. Louis 4, Mo.

Santolene: Reg. U. S. Pat. Off.

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1745-L South Second Street, St. Louis 4, Missouri

Please send: . . . . Information on Santolene C; . . . . Representative to discuss our problem of corrosion in . . . . . used for . . . . .

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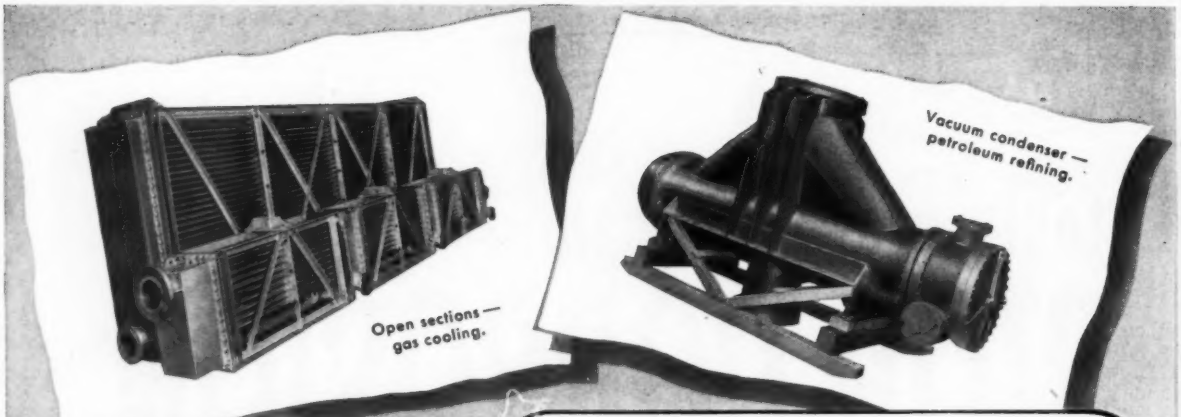
Street . . . . .

City . . . . . *Zone* . . . . . *State* . . . . .

SERVING INDUSTRY . . . WHICH SERVES MANKIND



"Specials," too

OFFER YOU UNIQUE ADVANTAGES HERE

The emphasis which Ross places on standardized small and medium sized exchangers, never for a moment overlooks the prime importance of special units. For the same engineering knowledge and manufacturing skill that built Ross' reputation in standardization, have built Ross' reputation in the field of specialization.

Those who require "specials" for individual process applications are, therefore, offered equally unique advantages here. For the Ross organization has built most every conceivable kind of unit for all manner of heat transfer problems. The experience and knowledge gained over the years can be a real advantage to you.

Remember that Ross "standard" units were once "specials". The same engineering knowledge and skill that made them possible can be well applied to your problems. Yes, you'll be far ahead by consulting early with Ross engineers to benefit from their singular know-how and experience.

BUILT TO T. E. M. A. STANDARDS

As a member of the Tubular Exchanger Manufacturers Assn., Ross fabricates in accordance with the published thermal and mechanical standards of T. E. M. A.

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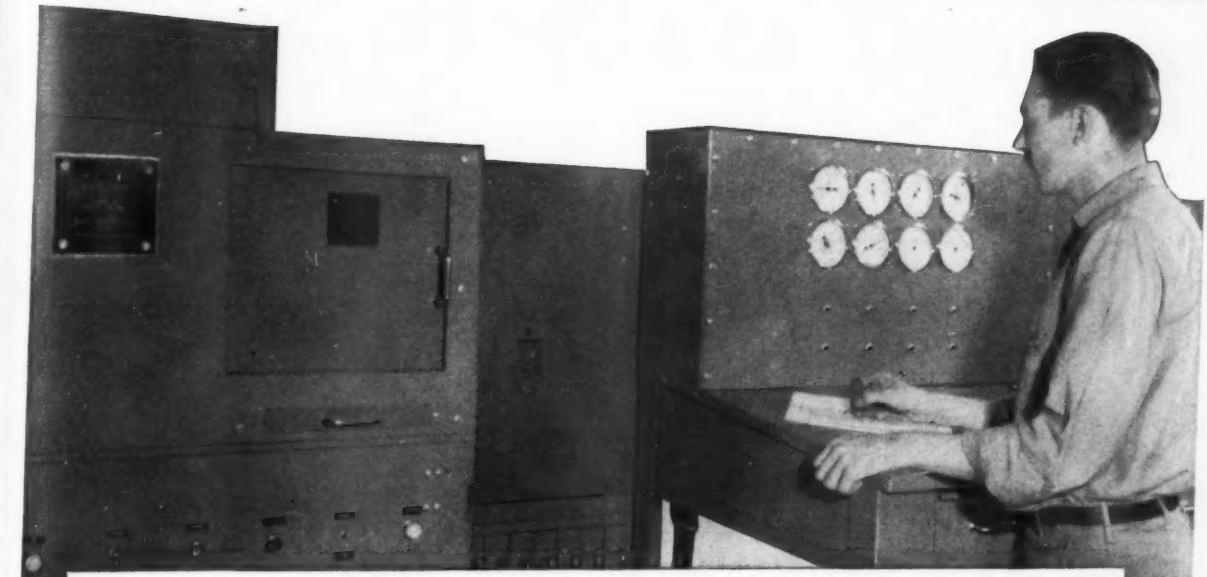
ROSS Specially Engineered **EXCHANGERS**

Serving home and industry

AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

Molten steel analyzed in 40 seconds!



Another reason why you're sure of UNIFORMITY with TIMKEN® forging steels

With the direct-reading spectrometer shown here—first in the steel industry—a molten heat of Timken® steel can be chemically analyzed in 40 seconds! This makes possible the most precise control of the steel's properties, helps insure uniform forgeability from heat to heat and from bar to bar.

The uniform forgeability of Timken steels, plus their superior surface and internal quality, gives you better finished forgings—with fewer rejects, delays and shop-practice changes.

For an on-the-job analysis of your operation by our Technical Staff, write us on your letterhead. Also ask for our "Technical Bulletin No. 31" which will give you the chemical composition of alloy steels. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, O. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

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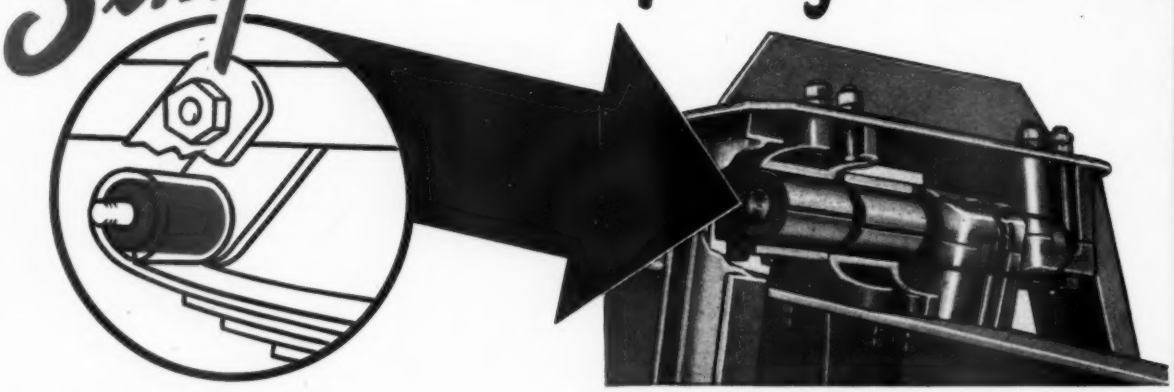
Simple as a Spring Shackle



CABOT Equalastic Evener Bearing

A rubber bushing does the trick of making the modern automobile spring shackle silent and long lasting.

Cabot, with the cooperation of the United States Rubber Company, applied this principle to the pumping unit evener bearing with even better results. 62 parts are eliminated; power flows more evenly from prime mover to bottomhole pump; no maintenance at this point means less upkeep for the entire Cabot Unit.

Let the advantages and savings of the Cabot Equalastic Evener Bearing work for you. Contact your nearby Jones & Laughlin Supply store for complete information.

- **62 Parts Eliminated**
- **Cushions Shock**
- **No Maintenance**
- **Absorbs Vibration**

Member Petroleum Equipment Suppliers Association

80 Stores
also
17 Sales Offices
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8 Resident Salesmen

. . . here's MY warehouse!"

Jones & Laughlin Supply Company

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J&L STEEL

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EXPORT: 405 LEXINGTON AVE., NEW YORK, N.Y. U.S.A.

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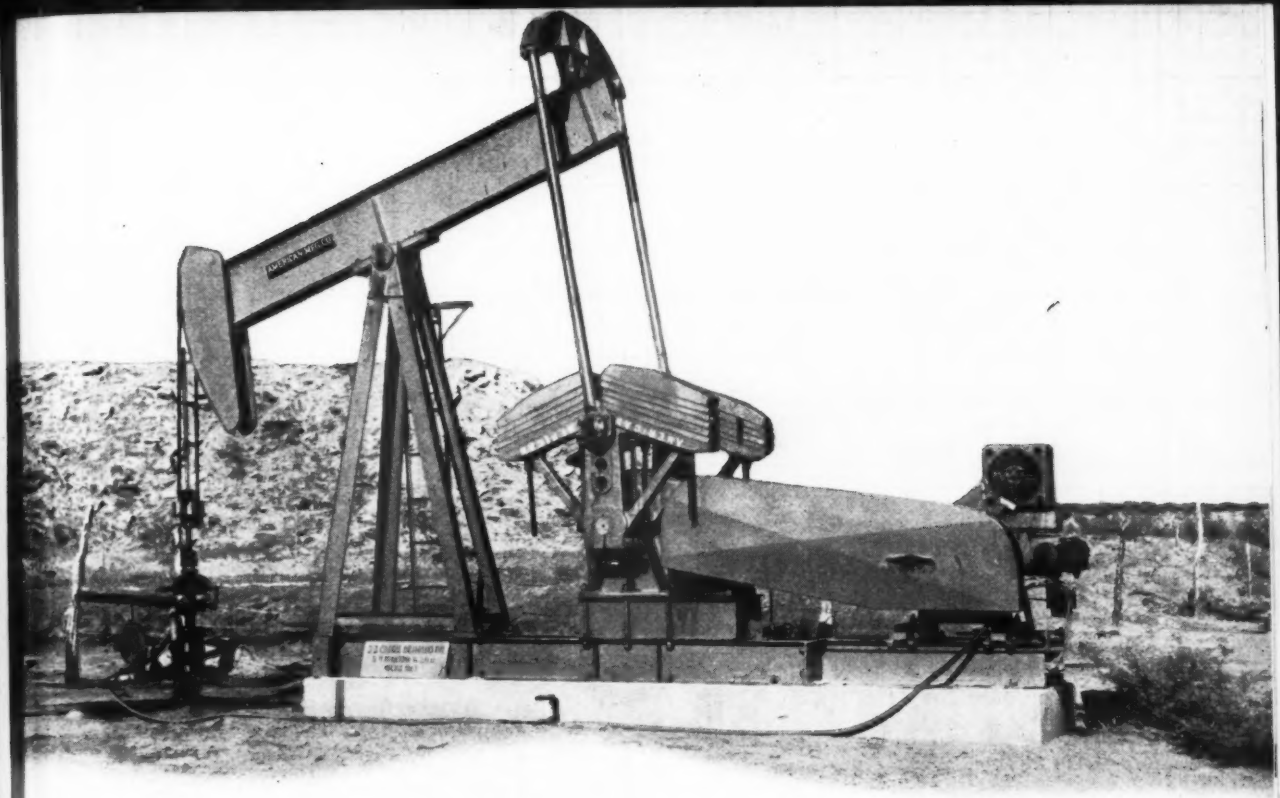


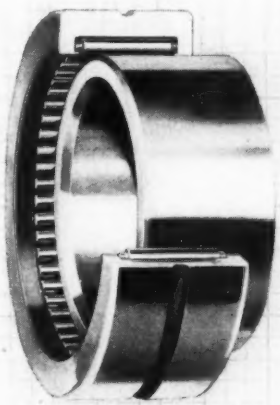
pump saddles ride easier...

WITH TORRINGTON BEARINGS

Saddle and equalizer friction and wear are minimized in pumping units of American Manufacturing Company of Texas by the use of Torrington heavy-duty NCS Needle Bearings.

For one thing, there are many cavities between small diameter rollers for retaining lubricant at all bearing surfaces. The full complement of rollers also provides maximum load capacity in minimum space for long, trouble-free service.

Where high load capacity, efficient anti-friction operation and compact design may benefit your product, consult Torrington's engineers on the application of Torrington Type NCS Needle Bearings.



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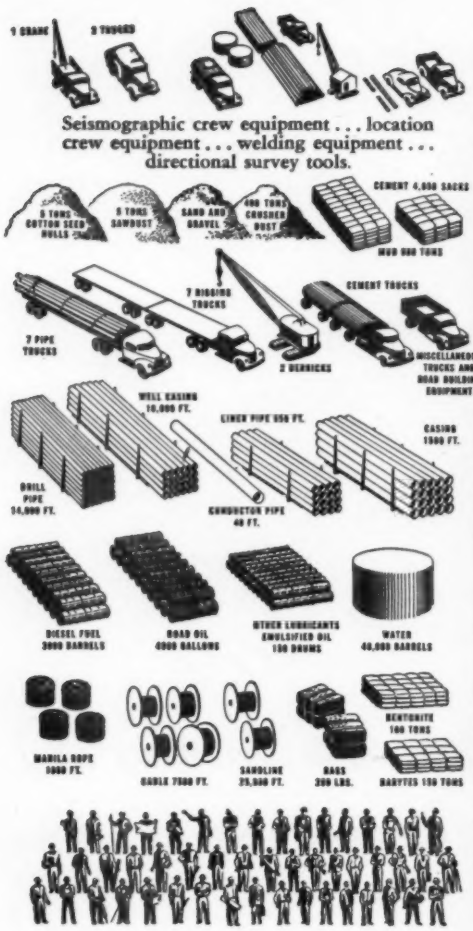
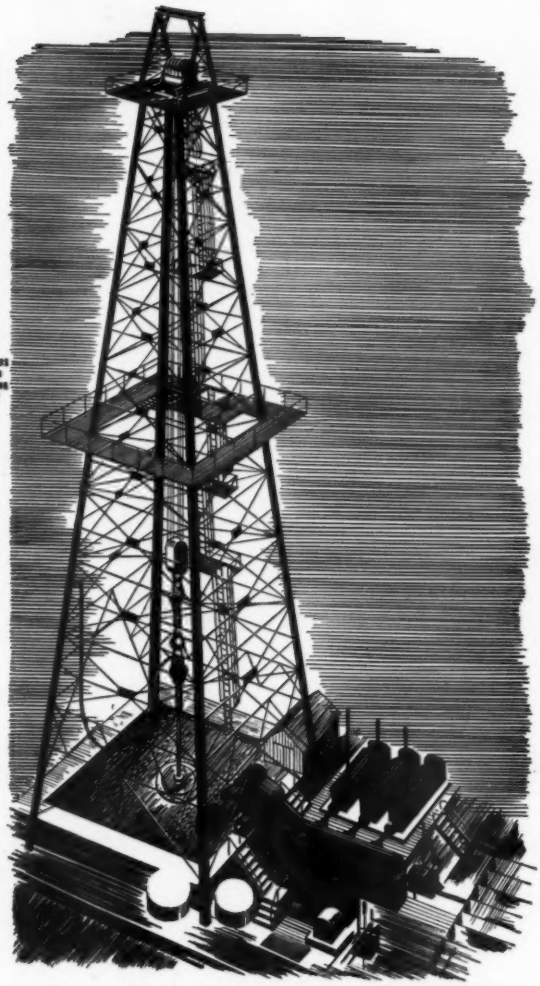


Seismographic crew equipment . . . location crew equipment . . . welding equipment . . . directional survey tools.

One hundred and thirty two men who are experts in many fields—law, geology, engineering, drilling, trucking, carpentry, derrick building, chemistry, mechanics and so forth.



One completed oil derrick with all its diesel engines, bits, fishing tools, reamers and other equipment.

Want to drill an oil well? Here's all you need

There *may* be oil under your backyard . . . but you might as well face the fact that it will take a bit of doing to find out.

The picture above shows all the men and materials needed to drill one 10,000-foot exploratory well here in the United States. Total cost will be anywhere from $125,000 to $1,000,000 depending on conditions encountered.

Will oil be found? Even with the best scientific help only about one out of every five exploratory wells drilled "come in."

The search for oil is a risky, expensive business, but it goes on every day in many parts of the world. In 1949 alone, we drilled 28 exploratory wells at a cost of $6,385,000 . . . six striking oil.

A great share of the profits of Standard of California goes back into the business in exploration of this kind . . . and in building new refineries, new pipelines, new storage plants and other facilities. From these come good petroleum products to serve you well . . . petroleum products to add still more strength to our nation in the uncertain days ahead.

STANDARD OIL COMPANY OF CALIFORNIA

plans ahead to serve you better

NOW 8 BASIC CHRYSLER ENGINES

FROM WHICH TO CHOOSE

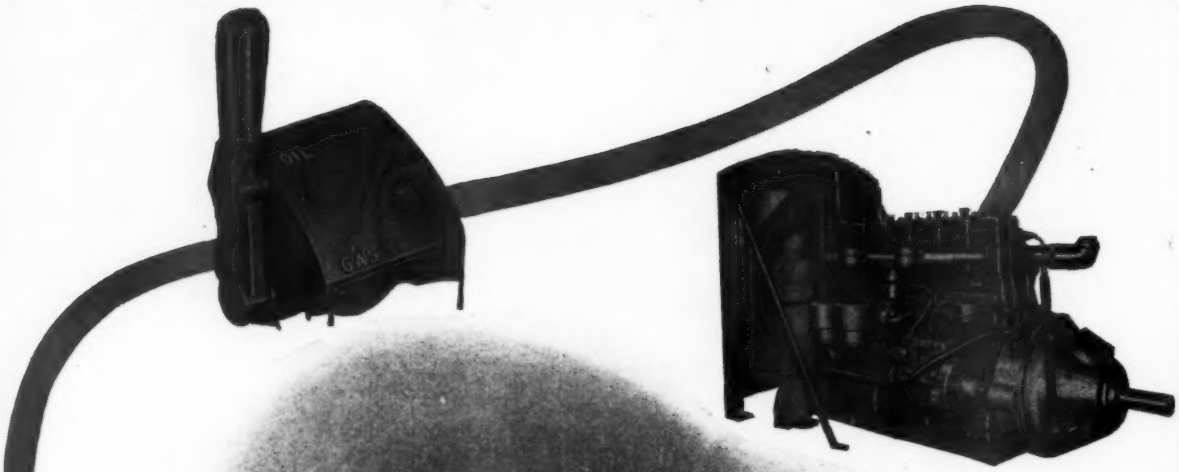
In scores of industrial applications, Chrysler Industrial Engines are out-performing all other similarly rated engines. With less down time! With lower lifetime cost per hour. That comes from famed Chrysler engineering and high precision manufacturing. Yet thanks to Chrysler mass production economies, you can buy Chrysler power for *less money!*

If you use internal combustion power requiring 200 to 400 cubic inches piston displacement, get *more for less!* Phone your Chrysler Industrial Engine dealer or write us. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.***

CHRYSLER

Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE



DUAL FUEL . . . . OR GAS . . .

both built for one job . . . drilling

Round-the-clock duty . . . sudden overloads . . . tough climates . . . fast acceleration . . . Superior Drilling Engines will handle them all, dependably, economically.

The Superior PTD dual-fuel engine is available in a wide range of horsepowers. Start your drilling operations on diesel fuel . . . merely move a lever to switch to low-cost gas when it's available. No loss of horsepower or efficiency.

For a dependable, field-proved gas engine, pick the Superior 6G-510 . . . easy to maintain . . . conservatively rated.

The National Supply store near you can supply bulletins, expert advice and service on Superior engines for all drilling purposes.

DIVISION OFFICES: CASPER, FT. WORTH, PITTSBURGH, TULSA, TORRANCE.

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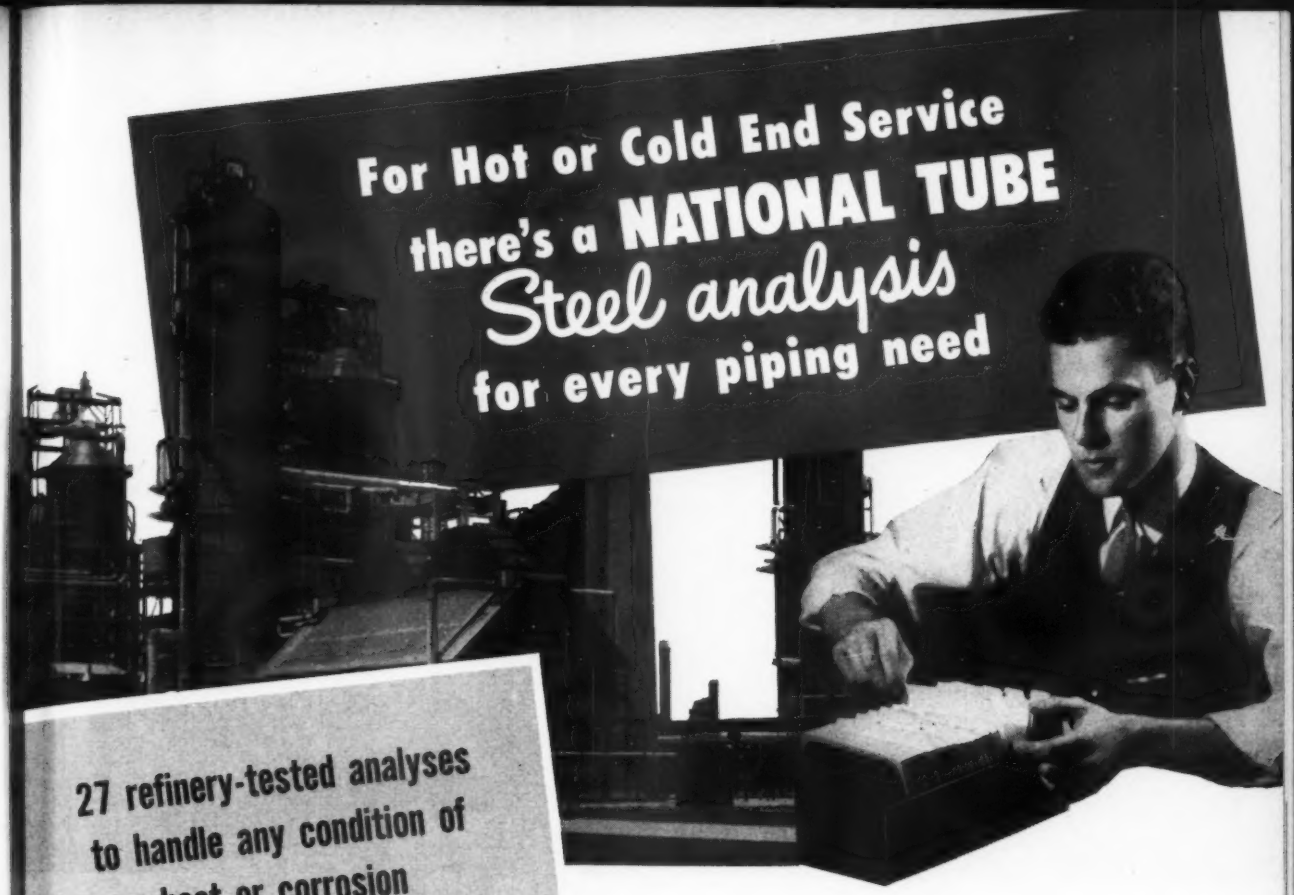
GENERAL SALES OFFICES: TOLEDO, OHIO

NATIONAL BLUE PRODUCTS

NATIONAL OIL FIELD MACHINERY AND EQUIPMENT . . . . SPANG PIPE . . . . SUPERIOR ENGINES



27 refinery-tested analyses to handle any condition of heat or corrosion

Low Carbon	7 Cr, ½ Mo
Low Carbon, ½ Mo	8 Cr, ½ Mo
Low Carbon, 1 Mo	8 Cr, 1 Mo
½ Cr, ½ Mo	9 Cr, ½ Mo
1 Cr, ½ Mo	9 Cr, 1 Mo
1¼ Cr, ½ Mo	12 Cr, Al
2 Cr, ½ Mo	17 Cr
2¼ Cr, 1 Mo	27 Cr
2½ Cr, ½ Mo, ¾ Si	18-8
3 Cr, ½ Mo, 1¼ Si	18-8 Ti
3 Cr, 1 Mo	18-8 Cb
5 Cr, ½ Mo	18-8 Mo
5 Cr, ½ Mo, 1½ Si	25-20
5 Cr, ½ Mo, Ti	

IN hot end service—elemental sulphur, hydrogen sulphide and mercaptins can cause real trouble—particularly if salt is present, and when pressures and temperatures are high.

Cold end service can be even worse: In addition to the sulphur compounds in charging stock, we find hydrochloric acid, sulphuric acid, sulphurous acid and many organic acids. And, if polymerization has been used, the cold end products may contain entrained sulphuric and phosphoric acid.

Here's the point: varied as your experience may be, you can't go wrong if you get free advice from the world's largest manufacturer of tubular products—National Tube Company. We have a tremendous file of case histories that deal with practically every known condition or *combination* of conditions that cause premature pipe and tubing failure. There's a good chance that your problem is a matter of recorded history in our files—solved by one of our 27 refinery-tested analyses.

In the event that yours is a totally *new* condition, our long experience will be of great help in selecting the proper alloy to do your particular job.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.
(Tubing Specialties Division)
COLUMBIA STEEL COMPANY, SAN FRANCISCO
PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

NATIONAL SEAMLESS PIPE AND TUBES

UNITED STATES STEEL

XUM

Where Dependable "Buffalo" Exhaust HELPS THE MAIN LINE BOOSTERS!

● The "Buffalo" Limit-Load Fans shown here are exhausting from 1300 h.p. booster engines on the main line of a well-known pipe line company. It's a rugged job for a fan, because it's continuous service. It's also no place for a fan that breaks down. That's why the choice was "Buffalo" . . . for efficiency, for durability, for low-cost maintenance. Remember, when you pick fans for large-scale jobs, that "Buffalo" Limit-Load Fans are:

1. *Non-overloading.* You cannot overload the motor, regardless of system pressure.

2. Available in exactly the size and arrangement your installation requires. Complete choice.

3. The choice of many leading engineers because of their performance characteristics.

"Buffalo" FIRST FOR FANS

WRITE FOR BULLETIN 3737

BUFFALO FORGE COMPANY

525 BROADWAY BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont., Branch Offices in all Principal Cities

VENTILATING FORCED DRAFT | AIR WASHING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT EXHAUSTING PRESSURE BLOWING

XU

extra service for your equipment when "WEAR-RESISTED" with AIRCO hardfacing alloys

Because of the hardness and other desirable characteristics of these alloys, they provide high resistance to all types of wear—abrasion . . . impact . . . heat . . . corrosion. One application often adds 2 to 25 times longer service life to *worn or new* parts . . . big dividends in savings of "down-time" and replacements.

There is an Airco alloy available for oxyacetylene flame or electric arc application to meet all types of wear conditions.

1. ***Severe abrasion and medium impact***
2. ***Shattering impact and abrasion***
3. ***Severe impact and abrasion***
4. ***Sliding abrasion and impact***
5. ***Extreme earth abrasion***
6. ***Corrosion and heat***

Constant research is developing new alloys to meet special wear problems as they occur.

If you have parts or tools subject to any type of wear, it will pay you to investigate the savings you can make in maintenance and replacement costs by using Airco Hardfacing Alloys.

For further information about Airco's complete line of "wear-resistant" alloys, write your nearest Airco office or Authorized Dealer for a free copy of the Hardfacing Alloys Catalog.

More news about AIRCO products

FOR SEVERE IMPACT AND RESISTANCE TO ABRASION
Airco No. 388 Electrode

A shielded arc electrode sufficiently high in alloy content to produce a deposit bearing approximately 9% chrome and 0.9% carbon. This alloy content results in a weld metal deposit which is essentially martensitic.

Operators will find that the exceptionally fine arc action of Airco No. 388 increases both the speed and quality of their work.

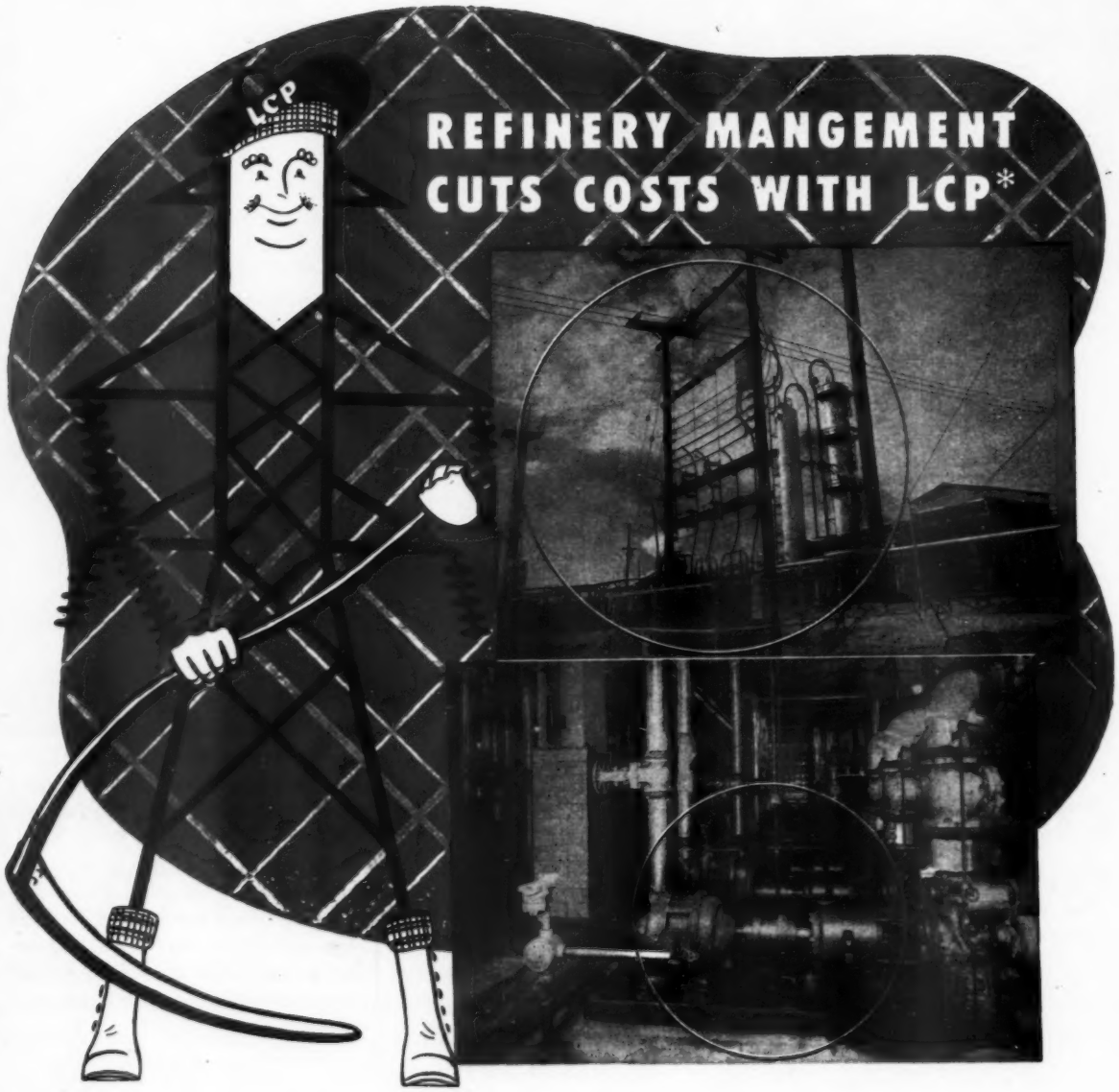
FOR RESISTANCE TO EXTREME EARTH ABRASION
Airco Tungtube
Nos. 8, 10, 20, 30 and 40

These are fabricated rods of tungsten carbide particles encased in a steel sheath. The various Tungtube numbers indicate the screen size of the tungsten carbide particles contained within the tube. With its extreme hardness tungsten carbide ranks second only to the diamond in earth cutting efficiency. It is accepted as the standard means of cutting non-metallic substances; such as, coal, shale, and granite. It is recommended for core bits, fishtail bits, road plows, coal cutter knives, plow shares and similar equipment subjected to extreme earth abrasion.

CORROSION – ACID RESISTANT ALLOYS FOR WELDING HARDER GRADES OF ALUMINUM BRONZE
Airco Nos. 100, 116, 120, 125 and 130 Electrodes

For joining aluminum bronze or other metals and combinations of dissimilar metals—and for overlays on bearing surfaces, machine parts, dies, etc. The deposits made with these electrodes are corrosion and acid-resistant and will also retard wear from abrasion and impact.

AIRCO **AIR REDUCTION**
Offices in Principal Cities



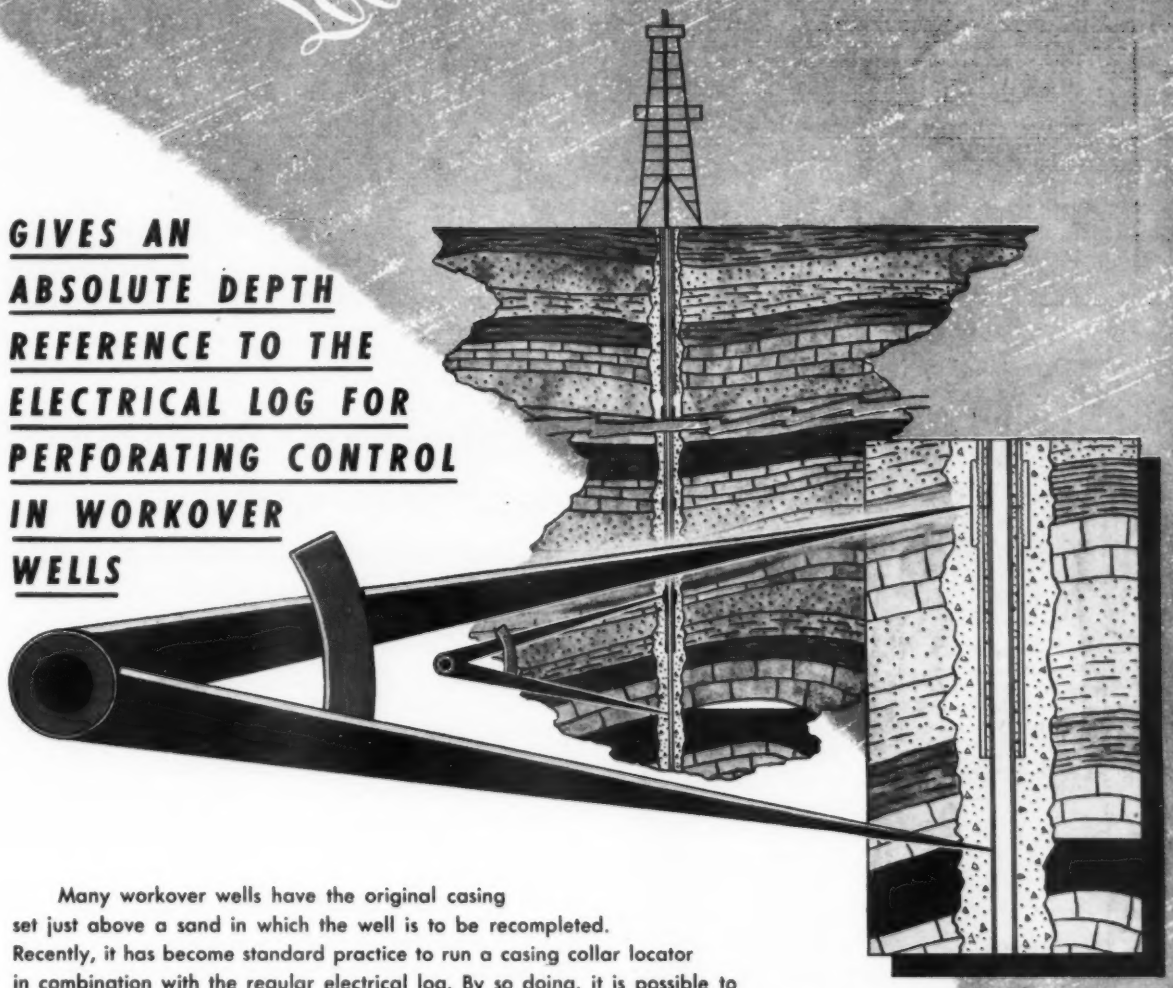
MORE and MORE REFINERIES USE *LCP EVERY DAY!

Always on the job—that's me! And with refiners that's what counts! No costly shut-down time when I'm delivering my constant, trouble-free service! I can take on a 24-hour shift or work according to any fractional time schedule. Automatic control does the trick—and saves you money on maintenance and labor. The Power Engineer of your Utility Electric Power Company has files galore on successful power conversions. Get the facts from him!

*LOW COST POWER

PETROLEUM ELECTRIC POWER ASSOCIATION

The SCHLUMBERGER Casing Collar Locator



GIVES AN ABSOLUTE DEPTH REFERENCE TO THE ELECTRICAL LOG FOR PERFORATING CONTROL IN WORKOVER WELLS

Many workover wells have the original casing set just above a sand in which the well is to be recompleted. Recently, it has become standard practice to run a casing collar locator in combination with the regular electrical log. By so doing, it is possible to establish definite distances between the casing collars and the projective formation. When the well is perforated, the same collars can be relocated and the shots placed with absolute control.

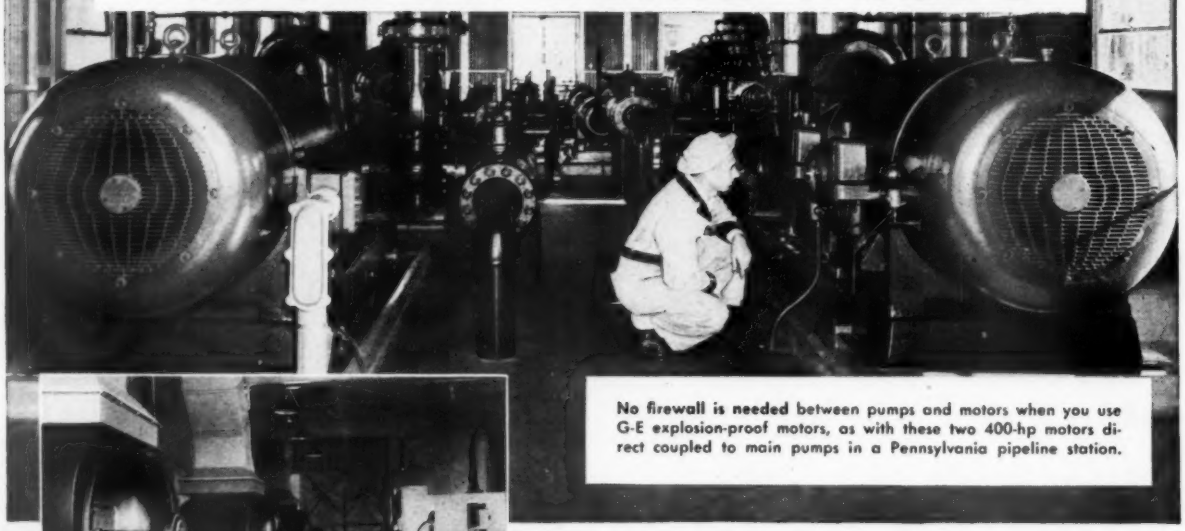
You should consider running a Casing Collar-Electrical Log combination on your next workover well.

SCHLUMBERGER

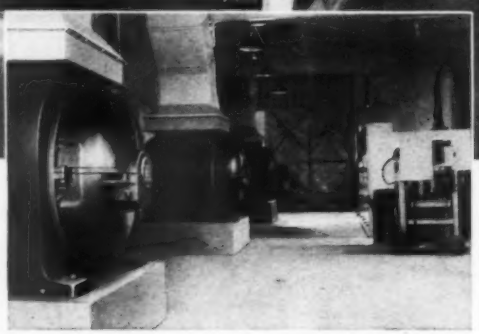
The Schlumberger Casing Collar Locator is another important development of Schlumberger's progressive program of research and engineering to provide advanced services to the oil industry.

SCHLUMBERGER WELL SURVEYING CORPORATION • HOUSTON

MOTORS TO MATCH YOUR PIPELINE NEEDS



No firewall is needed between pumps and motors when you use G-E explosion-proof motors, as with these two 400-hp motors direct coupled to main pumps in a Pennsylvania pipeline station.



Where a firewall is called for by station design, choose G-E squirrel-cage open induction motors for low-cost reliability. Here, three 1500-hp motors of this type, with top air-discharge enclosures, drive the pumps through a firewall in a Southern pipeline station.

No firewall is used with this 1500 hp G-E externally forced base-ventilated motor, one of several now being installed in a large Southwestern crude line. A separate motor-driven blower purges the motor and duct system of hazardous gases. Air ducts are located below the floor level.

Broad range of G-E motors makes correct selection easier

When you make General Electric your single supply source for all your electrified pipeline needs, you're sure of the widest variety of motor types and sizes to choose from:

Motors that meet any area condition—low-cost open motors to operate behind a firewall, or enclosed motors designed for use in hazardous areas which require no firewall.

Motors for centrifugal or reciprocating pumps—squirrel-cage induction motors of relative simplicity and low cost for centrifugal pumps, or synchronous motors with high operating efficiency and ability to improve load power factor for reciprocating pumps.

Motors for constant or adjustable speed—constant-speed motors direct-coupled to centrifugal pumps for lowest installed cost, or wound-rotor induction motors to supply adjustable speed for more efficient operation at reduced flow.

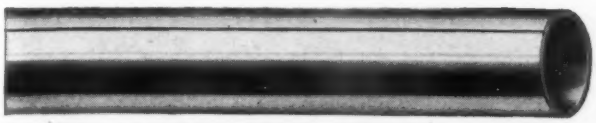
All these G-E motors offer the advantages of fast and easy installation, minimum maintenance, and long-lasting dependability. Selected with the aid of G-E application engineers who know pipeline industry needs, they're a good bet to help cut your pumping costs. For the full story, call your nearest G-E office. *Apparatus Dept., General Electric, Schenectady 5, N. Y.*

Worth seeing! It's "Lease on the Future", G-E's More Power to America movie on oil field electrification. Ask your G-E representative to arrange a showing.

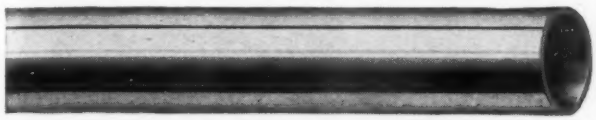
Everything you need to cut oil pipeline costs —ELECTRICALLY!

GENERAL ELECTRIC

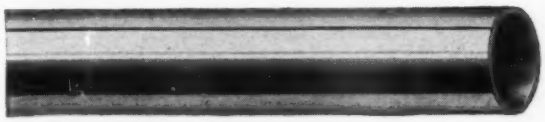
RESISTANCE TO CORROSION



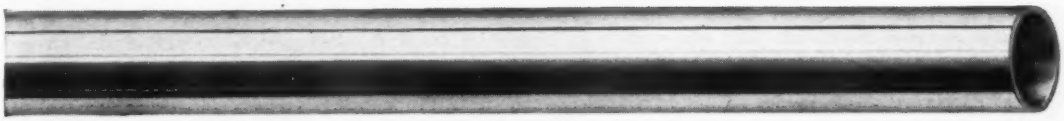
STRENGTH AT HIGH TEMPERATURES



RESISTANCE TO OXIDATION



EASE OF FABRICATION



What's Your Job For Stainless Steel Tubing? . . .

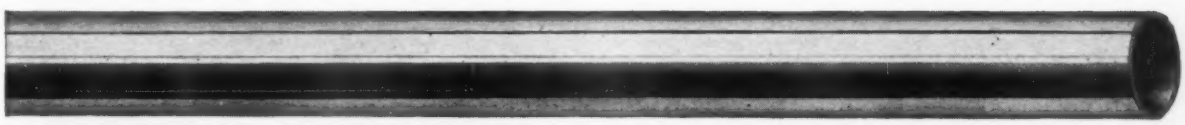
Do The Job Best With The Best Tubing For The Job – Get

GLOBE

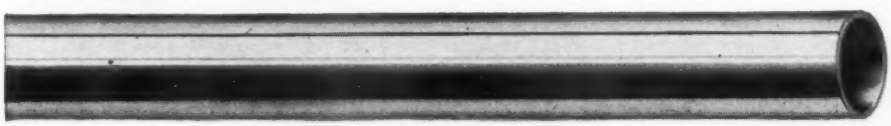
STAINLESS STEEL TUBES
Seamless or Welded

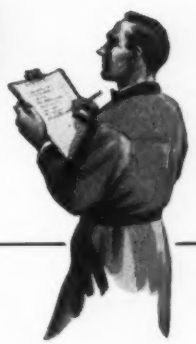
TYPICAL ANALYSES: 301 - 302 - 302B - 304 - 308 - 309 - 309S - 309Cb - 310 - 314 - 316 316Cb - 317 - 321 - 329 - 330 - 347 - 403 - 405 - 410 - 416 - 430 - 443 - 446 Inconel* Nichrome**

*Registered U. S. Trade-Mark. **Trade-Mark Reg. U. S. Pat. Off.-D-H Co.



SEAMLESS OR WELDED





Globe produces 26 standard analyses of stainless steel tubes — also special analyses when required.

Globe seamless stainless steel tubing may be had in sizes from ½ inch to 6⅜ inches O.D., and in pipe sizes ⅛ inch to 6 inches, standard, extra strong and double extra strong weights.

Gloweld electric welded stainless steel tubing may be had in sizes ranging from ¼ inch to 5 inches O.D. inclusive; in standard weight pipe (schedule 40) sizes ⅛ inch to 2 inches — in light weld pipe (schedule 40) sizes ⅛ inch to 4½ inches inclusive.

Globe engineers gladly give you the benefit of specialized knowledge of stainless steel tubing in a wide range of services and applications — to improve your product — to cut costs.

GLOBE STEEL TUBES CO., Milwaukee 4, Wis.

Chicago • Minneapolis • Cleveland • Detroit • New York • Philadelphia St. Louis • Tulsa • Houston • Denver • San Francisco • Glendale, Cal.

GLOBE TUBES

GLOBE SEAMLESS STAINLESS STEEL TUBES

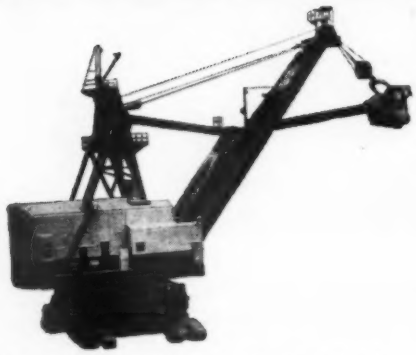
GLOWELD WELDED STAINLESS STEEL TUBES

Write for Bulletin 301 — Corrosion and Heat Resisting Steel Analyses Chart — a valuable reference tabulation of stainless steel analyses as produced by various manufacturers.

Patience versus Power

PETROLEUM PROGRESS HELPS MOVE THE EARTH

Mountains became molehills. Railroads and highways replaced wastelands and wilderness. Dams, dikes, bridges, buildings, homes—all are built on sound foundations after the rapid removal of earth, thanks to petroleum.



Digging and filling. Lifting and loading. Ploughing and scraping. Probing the earth's surface for coal, iron and valuable minerals. These are the back-breaking jobs that petroleum has made easier and more profitable for man. Texaco, on the job, is a familiar name to engineers and contractors everywhere.

INFINITE patience was the lot of early man. Then he extended his restricted powers by domesticating animals. Tremendous U. S. expansion called for a faster pace. Petroleum for power and lubrication gave the answer. Today Texaco is supplying quality fuels or lubricants for tractors, bulldozers, giant shovels and other specialized earth-moving equipment.

Petroleum research pointed the way to the solution of one of man's most primitive but demanding problems—moving the earth.

THE TEXAS COMPANY

Petroleum Promotes Progress

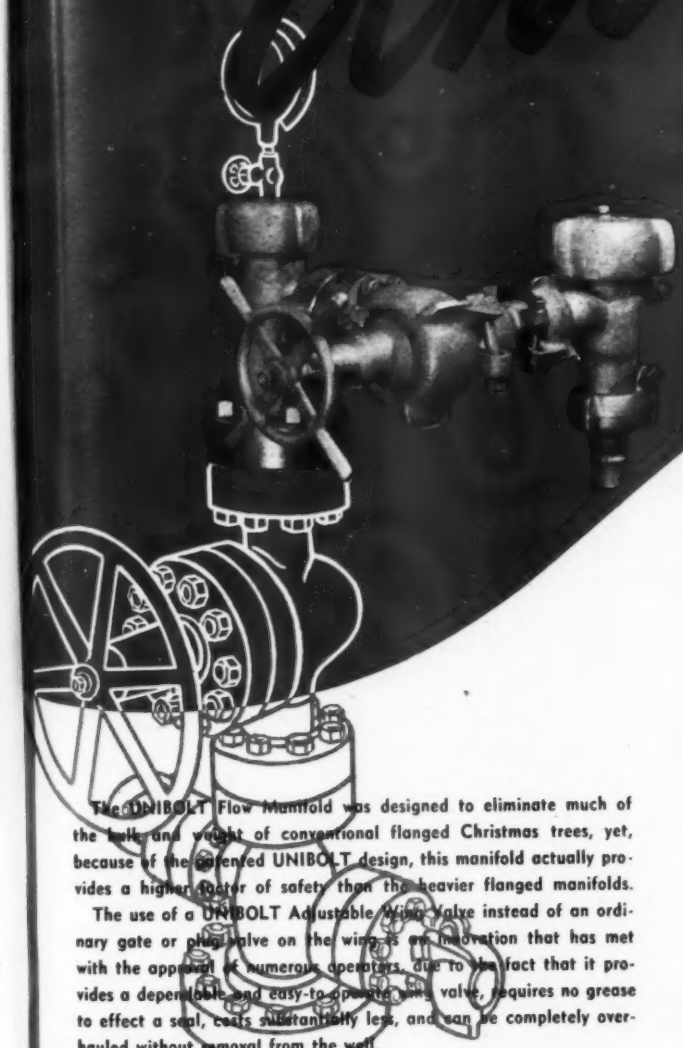
TEXACO REG. T. M.

TELL YOUR CHRISTMAS TREE SUPPLIER TO FURNISH

Unibolt

FLOW MANIFOLDS

—THEY MAKE ANY TREE LIGHTER, STRONGER, MORE ECONOMICAL!



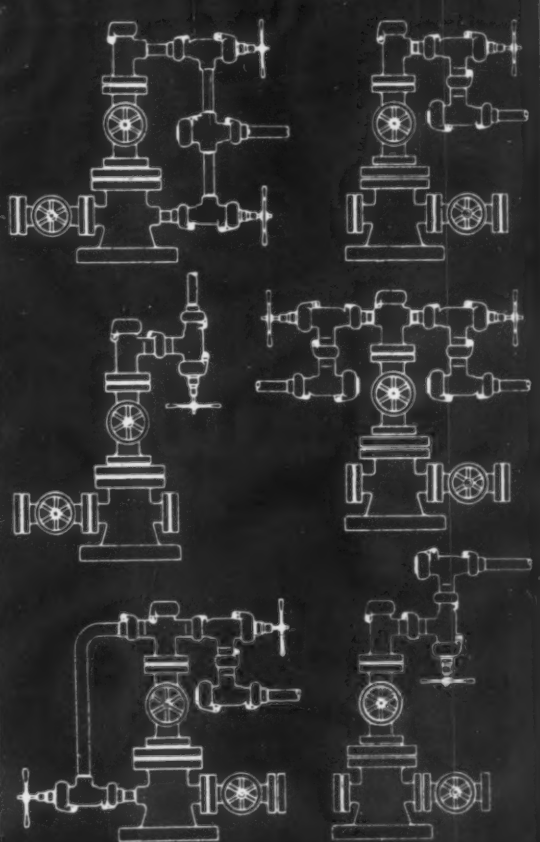
The UNIBOLT Flow Manifold was designed to eliminate much of the bulk and weight of conventional flanged Christmas trees, yet, because of the patented UNIBOLT design, this manifold actually provides a higher factor of safety than the heavier flanged manifolds.

The use of a UNIBOLT Adjustable Wing Valve instead of an ordinary gate or plug valve on the wing is an innovation that has met with the approval of numerous operators, due to the fact that it provides a dependable and easy-to-operate wing valve, requires no grease to effect a seal, costs substantially less, and can be completely overhauled without removal from the well.

Another important advantage of the UNIBOLT Flow Manifold is its complete interchangeability. All connections in the manifold are standard forged steel UNIBOLT Couplings, and any unit in the assembly, or part thereof, may be easily and quickly replaced in the field without removing the manifold from the well.

See your Composite Catalog for complete details, or write direct for literature.

UNIBOLT ADJUSTABLE WING VALVES AND POSITIVE CHOKES MAY BE ASSEMBLED IN ANY DESIRED TYPE OF MANIFOLD TO BEST SERVE INDIVIDUAL WELL REQUIREMENTS



THORNHILL-CRAVER CO.

HOUSTON UNIBOLT THE ONE BOLT COUPLING **TEXAS**

XUM

QUICK ACCEPTANCE *in the gas transmission field!*

WORTHINGTON

Pipe line companies purchase over 100 Worthington uniflo design TYPE UTC-16 angle gas engine compressors

It takes time — and actual working conditions — to show how equipment stands up. That explains the keen interest of transmission companies and refineries when the first commercial installation of Worthington's new Angle Gas Engine Compressor TYPE UTC-16, was dismantled for inspection. After 2763 hours of continuous operation — under full load and frequent overload — it was found that:

- **All parts were carbon-free,** demonstrating the marked superiority of Worthington uniflo scavenging over conventional loop scavenging for reducing wear.
- **Pistons and liners were still well within shop tolerances,** and the high polish on the entire liner surfaces indicated A-1 operating condition.
- Rings showed minimum wear, with tool marks still visible.
- Bearings were all in perfect condition.

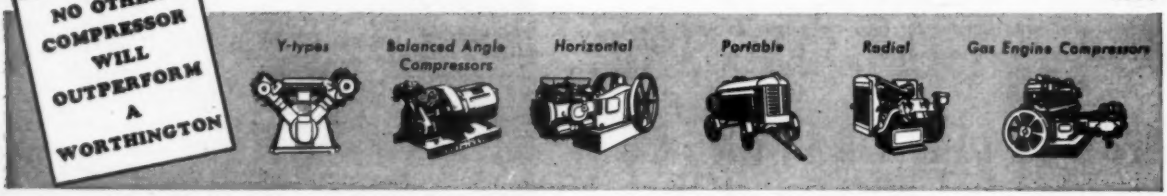
A Success From The Start

Shop tests had already proved TYPE UTC-16's more thorough scavenging, and perfect combustion. Now, this far more conclusive field test proved the ability to assure these benefits over a long, trouble-free service life. And a steadily growing list of purchasers has established TYPE UTC-16 as a real history-maker in the development of more efficient, more economical gas transmission.

Why not investigate the many advantages of joining this list? Get the whole story that proves *there's more worth in Worthington* from our nearest District Office. Or write to *Worthington Pump and Machinery Corporation, Engine Division, Buffalo, N. Y.*

EX-6-3

NO OTHER COMPRESSOR WILL OUTPERFORM A WORTHINGTON



RUNNING TIME:

1000 feet per hour

with

REPUBLIC ELECTRIC WELD CASING

● A Louisiana driller landed a 4980-foot string of 7-inch J-55 Republic Electric Weld Casing in five hours, thirty minutes. A Texas contractor ran 6208 feet of 5½-inch H-40 in just six hours. Both these strings were run at an *average rate close to 1000 feet per hour.* A California drilling contractor ran 7051 feet of 7-inch J-55 Republic Casing in *nine hours flat, including time for cementing with 600 sacks.*

These reports are typical of hundreds more attesting to the remarkable running speed made possible with this advanced casing. Its straight, true lengths handle easily and stab quickly. Clean, full-formed threads spin-in and tong-up *fast* and tight . . . save plenty of man-hours on every job.

In addition to fast make-up, accurate threads with a substantial amount of tough steel under the root line mean extra joint strength . . . fewer pull-outs. Next time you order, specify the tubular products with a reputation for top running speed—Republic Electric Weld Casing and Tubing.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, New York

Republic Electric Weld Casing and Tubing are made from flat-rolled steel, both sides of which are inspected. Thus, the surface which becomes the inside wall is free from hidden defects.

REPUBLIC *Electric Weld* **NORMALIZED CASING AND TUBING**

REPUBLIC STEEL

Other Republic Products include Line Pipe—Carbon, Alloy and Stainless Steels—Upson Studs, Bolts and Nuts—Electrunite Heat Exchanger Tubes

XUM

Submersible Drill Barges-

The Texas Company drill barge "Rhodes" on location in South Louisiana. The drill barge "Gibbens" was also built by Levingston for The Texas Company.

"A COMPLETE PACKAGE"

BY

Levingston

From crown block to barge bottoms, Levingston is prepared to accept the entire responsibility of constructing and rigging-up your submersible drill barges on a turn-key basis. You select the tools, or equipment, and Levingston's experienced organization will install them for safe and efficient operation on marine locations.

Levingston

SHIPBUILDING COMPANY • ORANGE, TEXAS

SAVE "DOWN TIME" ON MARINE DRILLING EQUIPMENT REPAIRS

Levingston know-how and dry dock facilities provides the industry with a conveniently located repair yard for all types of marine drilling equipment . . . from LST's to drill barges to oil barges.

Day Phone: 8-3521; Night Phones: L. J. Vincent, Repair Superintendent, Phone 8-4516; George Duchamp, Ass't Repair Superintendent, Phone 8-4841.

Today it's Roebling!

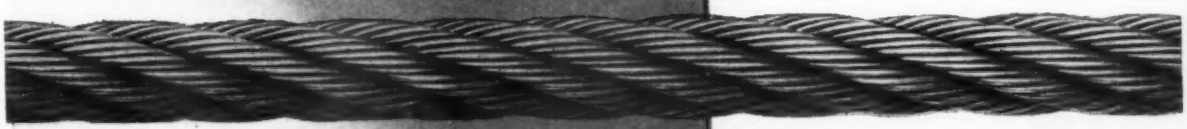
As rotary drilling lines, Roebling 6x19 Preformed "Blue Center" Steel Wire Rope with Independent Wire Rope Core has demonstrated extra life on the job and substantial dollar savings.

Why men who watch costs... specify Roebling Preformed

THE RECORDS PROVE IT... that Roebling Preformed "Blue Center" Wire Rope stays on the job longer and cuts your costs. This is partly because "Blue Center" steel—developed and made only by Roebling—has unsurpassed resistance to abrasion, shock and fatigue. In large measure, too, it is because of the painstaking care, special techniques and modern precision machines that guard and maintain Roebling quality leadership.

Preformed a big help, too. Wide experience in the field proves that Roebling *Preforming* brings still more operating economies. Preformed is easier and faster to handle and install. You can cut it without seizing. It winds better... is not apt to set or kink... minimizes vibration and whipping.

Today's best buy. Roebling makes wire rope of every construction, grade and size ... engineered for top efficiency on every type and make of rope-rigged equipment. Have your Roebling Field Man recommend the *right* rope for best, low-cost performance on each installation. John A. Roebling's Sons Company, Trenton 2, N. J.



ROEBLING

A CENTURY OF CONFIDENCE

DISTRIBUTED BY

THE NATIONAL SUPPLY COMPANY

REPUBLIC SUPPLY COMPANY

XUM

AXELSON
FIRST CHOICE

Unquestioned Reliability and Assured Performance

For more than 50 years, Axelson has consistently applied their manufacturing "know how" to practical oil field pumping operations...with the result that Axelson Sucker Rods are considered by petroleum producers to be "first choice" under all pumping conditions.

AXELSON PETROLEUM PRODUCTION EQUIPMENT

WRITE FOR BULLETINS ON: Sucker Rods and Couplings, Pump Liners, Pump Plungers, Balls and Seats, Specific Deep Well Plunger Pump Assemblies, Long Stroke Pumping Units, Pumping Accessories.

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

AXELSON PETROLEUM PUMPING EQUIPMENT

Ask Axelson experts for practical answers

AXELSON MANUFACTURING CO. • PLANTS — Los Angeles 58; St. Louis 15 • OFFICES — New York City 17; Buenos Aires, Argentina; Caracas, Venezuela • DISTRIBUTORS — Jones & Laughlin Supply Co.; Gulf Machine Tool & Supply Co.; Industrial Agencies, Ltd., San Fernando, Trinidad; B.W.I.; Industries Mobiliz S.A. Commercial, Barcelona and Manresa, Spain; Dominion Oil Tool Supply Co., Ltd., Calgary, Canada.

They Say—

Oil Plans Ahead

"The oil industry always has been one to plan ahead for the future. In peace, it fuels and powers our high-riding economy and in war it has always been able to provide the necessary amounts of petroleum. In the last 5 years, the industry has expanded enormously, so that today it is in the best shape it ever has been to meet any national emergency. This accomplishment has been made possible by the competitive activities of the 34,000 companies and individual operators who comprise the industry. They range in size all the way from the single-rig wildcatter, to the large integrated companies, who handle petroleum and its products all the way from the well to the consumer.

"In giving credit to all who comprise the very complex oil industry, I must be realistic and say that I think there were many things involved that could have been done only by the big, integrated companies.

"Exploration and oil field development in wilderness areas remote from available markets is one example of what they have done. Offshore drilling, a very costly operation, is another. Pipe-line and tanker construction demand large outlays. Modern refinery units that accomplish chemical miracles on a vast scale are multimillion-dollar jobs. So is research, which, by and large is done by bigger companies. The results of this research benefit the industry as a whole and the public, too, in new and improved petroleum products. Integration provides the flexibility that has been a distinguishing characteristic of the oil industry."

T. S. Petersen, president, Standard Oil Co. of California, in a speech before the Sacramento Rotary Club.

A New Conception

"In the last 20 years, a new conception of petroleum production and petroleum law has become accepted practice, in marked contrast to the methods of earlier days. Technological studies are continuously being made to increase the ultimate recovery of oil fields. The natural pressures and energies so essential to oil recovery are periodically measured and conserved. In many cases the maintenance of natural-reservoir energies is affected by injecting gas or water into the formations.

"Many oil fields that were nearing exhaustion have been rehabilitated by secondary-recovery methods of production. Methods of injecting wa-

ter or gas into the oil formation to restore the energies that propel oil through the formations are now being successfully used in many fields to augment production. Estimates of the probable additions to reserves by the application of secondary-recovery methods to depleted oil fields are in excess of 7 billion barrels or equal to 25 per cent of the nation's total oil reserves.

"The fact that a high percentage of the oil in producing sands cannot be economically recovered by normal production methods presents a continuing challenge to the enterprise and resourcefulness of oil producers. Much has been accomplished in this regard and steady progress is being made through increased knowledge and experience so that we can confidently expect a much greater recovery of oil from the nation's oil reserves in the future."

J. Ed Warren, president, Independent Petroleum Association of America, speaking at the I.P.A.A. Forum on Petroleum.

For the Days Ahead

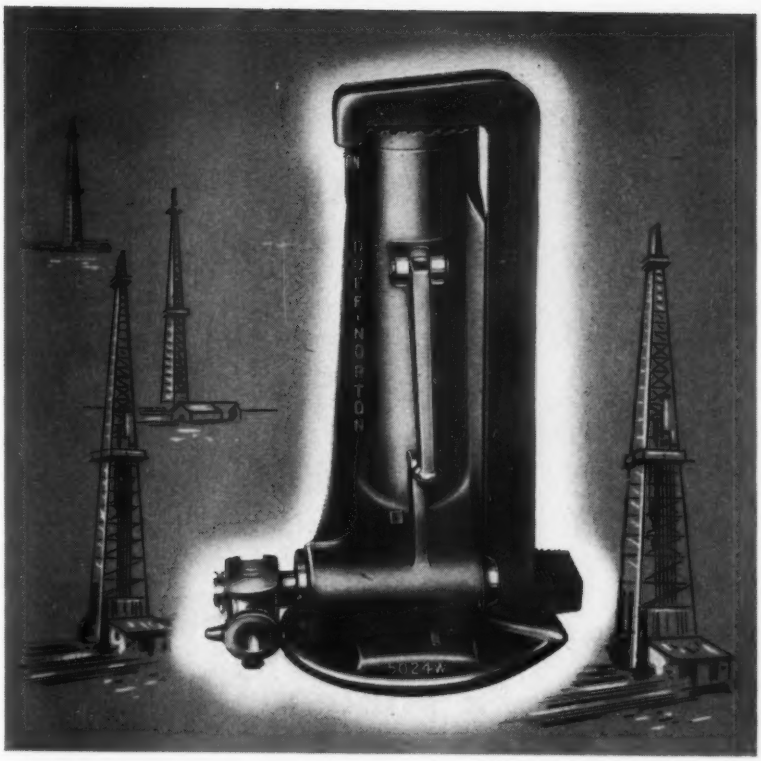
"Progressive farmers of the present use oil-powered machinery and petroleum-based chemicals to multiply their productivity many times They work with almost 4 million tractors, 8 million trucks and automobiles, and other millions of motorized implements. As a result, one farmer can produce enough food and fiber to feed and clothe himself and 14 other persons.

"The changeover from horses and mules to machines and petrochemicals was highlighted recently when a teen-age boy won national honors in a tractor-maintenance contest. This youth supported himself and his widowed mother by working a 200-acre farm alone while completing his high-school education.

"Intelligent teamwork among farmers and men of the petroleum, chemical and equipment industries has developed machinery, fuels, fertilizers, and many other products to bring about a revolution in American agriculture. Farmers today rely on oil men to supply them with about 10 billion gallons of petroleum products yearly. As a result, they are able to battle on even terms with weeds, erosion, diseases, and insect pests.

"Much of the $100,000,000 spent annually on petroleum research goes to improve crops and livestock. Already beyond experiment is the use of carbon black to fight killing frosts. Effective, too, are new types of fertilizers injected directly into the ground spread by plane or mixed with irrigation water. Continuing research assures even better things for the days ahead."

Excerpt from "Ahead With Oil," prepared by Oil Industry Information Committee.



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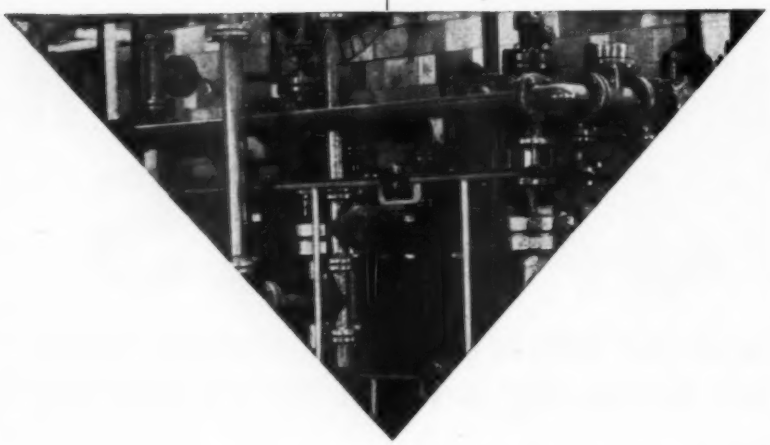

The conveyance of corrosive liquids can prove as hard on profits as it is on equipment. It's this realization that has compelled more plants than ever before to install corrosion-resistant saran lined steel pipe. Saran's resistance to most chemicals and solvents reduces shutdowns and lost production! Saves time and labor!

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DOW
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CALENDAR

1951

January

American Gas Association, home-service workshop, Hotel Statler, Washington, D. C., January 3-5.

Kansas Oil Men's Association, annual convention, Lassen Hotel, Wichita, January 8-9.

Society of Automotive Engineers, annual meeting and engineering display, Hotel Book-Cadillac, Detroit, January 8-12.

American Institute of Electrical Engineers, Tulsa Section, meeting on explosion-proof motors, Michaelis Cafeteria, January 11.

Southwestern Legal Foundation, second annual institute on oil and gas law and taxation, Southwestern Legal Center, Dallas, January 18-20.

Compressed Gas Association, annual meeting, Waldorf-Astoria Hotel, New York City, January 22-23.

Northwest Petroleum Association, annual convention, Nicollet Hotel, Minneapolis, January 25-26.

Southern Gas Association, employe-relations section and accident-prevention round tables, Mobile, Ala., January 26.

Instrument Society of America, New York section, Hotel New Yorker, New York City, January 26-27.

February

American Institute of Electrical Engineers, Tulsa Section, meeting on explosion-proof electrical equipment, Michaelis Cafeteria, February 8.

American Institute of Mining and Metallurgical Engineers, annual meeting, Jefferson and Statler hotels, St. Louis, February 19-22.

Kentucky Petroleum Marketers Association, annual meeting and trade show, Brown Hotel, Louisville, February 20-21.

Iowa Independent Oil Jobbers' Association, Inc., annual convention, Hotel Fort Des Moines, Des Moines, February 21-22.

Wisconsin Petroleum Association, annual convention and equipment show, Milwaukee Auditorium, Milwaukee, February 27-28.

March

American Society for Testing Materials, spring meeting and committee week, Cincinnati, March 5-9.

American Petroleum Institute, division of production, southwestern district meeting, Hotel Beaumont, Beaumont, Tex., March 7-9.

Indiana Independent Petroleum Association, spring convention and refiners and suppliers exhibit, Hotel Severin, Indianapolis, March 8-9.

Mid-West Gas Association, Hotel Fontenelle, Omaha, March 12-14.

Illinois Petroleum Marketers Association, annual convention, Sherman Hotel, Chicago, March 13-15.

National Association of Corrosion Engineers, annual conference and exhibition, Statler Hotel, New York City, March 13-17.

Gas Appliance Manufacturers Association, annual meeting, The Homestead, Hot Springs, Va., March 19-21.

Ohio Petroleum Marketers Association, annual convention and marketing exposition, Deshler-Wallick Hotel, Columbus, Ohio, March 20-22.

American Petroleum Institute, division of production, Mid-Continent district spring meeting, Herring Hotel, Amarillo, March 21-23.

Texas Independent Producers and Royalty Owners Association, fifth annual meeting, Beaumont, Tex., March 27-28.

New England Gas Association, annual meeting, Hotel Statler, Boston, March 29-30.

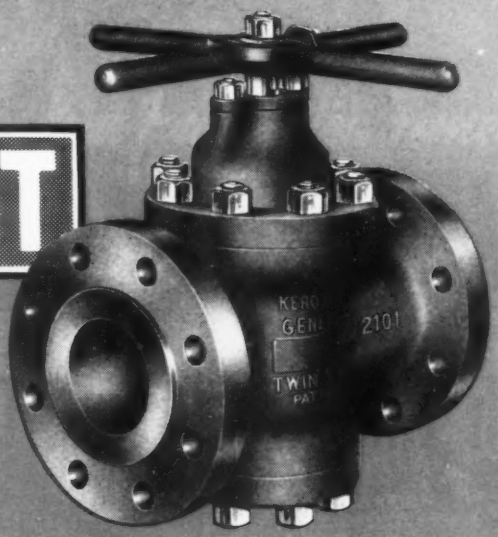
April

American Gas Association, industrial and commercial gas section, conference on industrial and commercial gas, Shoreham Hotel, Washington, D. C., April 2-4.

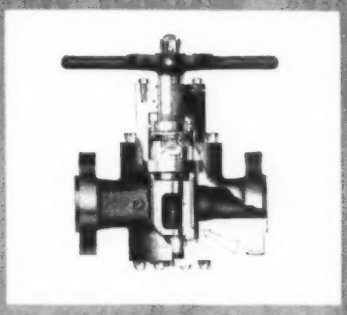
American Society of Mechanical Engineers, spring meeting, Atlanta, April 2-5.

Instrument Society of America, New

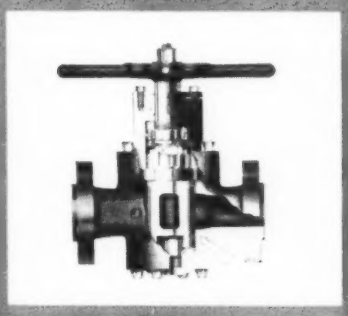
KEROTEST



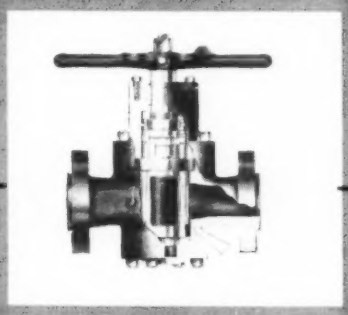
GENERAL
TWIN SEAL VALVE
VAPOR-TIGHT SEAL!



POSITION I—Plug down . . . seats expanded against body parts . . . valve full closed.



POSITION II—Plug raised . . . seats retracted clear of body wall . . . free rotation . . . no scoring.



POSITION III—Plug rotated 90° . . . valve full open.

Here is a new expanding seat, tapered plug valve that assures positive vapor-tight shut-off in either flow direction for gas or volatile liquid service. One and a quarter turns operates from full open to full closed position. No lubrication is required. Nothing to score, gall or wear. Renewable seats are replaced quickly through bottom plate. For easy operation . . . positive shut-off and freedom from maintenance, specify the Kerotest General Twin Seal Plug Valve.

1. SHUTS OFF *VAPOR-TIGHT*
2. EASY TO OPERATE
3. NO LUBRICATION
4. QUICK (1¼ turns) OPERATION
5. NO SCORING OF SEATS
   (Seats rotate free of body wall)

WRITE for descriptive booklet giving size and pressure range, and full specifications.

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XUM

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with this true Light-Duty four wheel drive

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14,500 lbs. Gross Vehicle Weight

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The only way to gain safety, economy and widened operation with a four-wheel-drive is to have proper distribution of load and power. FWD, alone, delivers those major advantages for this work-range.

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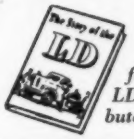
Only a *real* truck engine can give you peak efficiency for all the work demanding the LD. This efficiency creates on-the-job advantages, longer engine life and attractive savings in gas and oil.

FWD LIGHT-DUTY model fills important truck-transport gap in the oil production field

If "oil is where you find it"— the LD is a better, more economical answer to your problem of getting what you need where you want to take it. You'll find the LD is factory engineered to easily do those tough jobs that *conventional* trucks and *conversions* have tried to serve. Whether it's mounting drill rigs, providing a firm safe mounting for geophysical instruments — or hauling water or explosives — the LD completely fills the need for a powerful, sure-to-get-there, moderately-priced, light-duty FWD.



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World-Wide Sales and Service

Built by the Makers of America's Foremost Heavy-Duty Trucks

Jersey section, Essex House, Newark, N. J., April 3.

American Petroleum Institute, division of production, Eastern district meeting, Desher-Wallick Hotel, Columbus, Ohio, April 3-5.

Mid-West Regional Gas Sales Conference, Edgewater Beach Hotel, Chicago, April 9-11.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, April 10-12.

American Gas Association, distribution, motor vehicle, and corrosion conference, Hotel Peabody, Memphis, April 16-18.

American Society of Lubrication Engineers, annual convention and lubrication show, Bellevue-Stratford Hotel, Philadelphia, April 16-18.

National Petroleum Association, Hotel Cleveland, Cleveland, April 18-20.

American Petroleum Institute, Rocky Mountain district spring meeting, Gladstone Hotel, Casper, Wyo., April 19-20.

Southern Gas Association, Buena Vista and Edgewater Gulf hotels, Biloxi, Miss., April 23-25.

Natural Gasoline Association of America, annual convention, Mayo Hotel, Tulsa, April 25-27.

Indiana Gas Association, French Lick Springs Hotel, French Lick, Ind., April 26-27.

American Gas Association, industrial and commercial gas section, industrial gas school, William Penn Hotel, Pittsburgh, April 29-May 4.

American Geophysical Union, thirty-second annual meeting, National Academy of Sciences, Washington, D. C., April 30-May 2.

American Petroleum Institute, division of refining, sixteenth mid-year meeting, Mayo Hotel, Tulsa, April 30-May 3.

May

Liquefied Petroleum Gas Association, annual convention and trade show, Stevens Hotel, Chicago, May 6-9.

Gas Appliance Manufacturers Association, natural-gas department spring meeting, Dallas, May 7-9.

American Petroleum Institute, division of production, Pacific Coast district, spring meeting, Biltmore Hotel, Los Angeles, May 10-11.

American Institute of Chemical Engineers, regional meeting, Hotel Muehlebach, Kansas City, May 13-16.

American Gas Association, operating section, production and chemical conference, Hotel New Yorker, New York City, May 14-16.

Pennsylvania Gas Association, Wernersville, Pa., May 15-17.

American Petroleum Institute, division of marketing, mid-year meeting, Cincinnati, May 28-29.

Third World Petroleum Congress, Kurhaus, Scheveningen, the Netherlands, May 28-June 6.

American Petroleum Institute, standardization and standing committees, division of production, mid-year meeting, Brown Palace Hotel, Denver, May 28-June 1.

June

American Society of Mechanical Engineers, semiannual meeting, Toronto, Ont., Canada, June 11-15.

Canadian Gas Association, Bigwin Inn, Lake of Bays, Ont., Canada, June 16-20.

American Society for Testing Materials, annual meeting, Atlantic City, N. J., June 18-22.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month. Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

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KINZBACH
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ONE-MAN OPERATION
FAST, SAFE, POSITIVE GRIP
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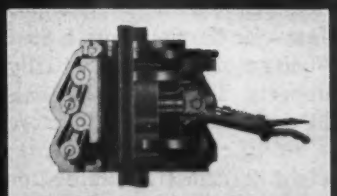
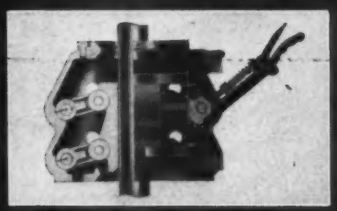


Running in. Slip segments are fully retracted



Slip Set. Note that slip segments are still parallel with the centerline of the pipe. Handle is locked in "closed" position.

This revolutionary development in Tubing Spiders, utilizes parallel-linkages to control the slip segments—a design which makes pipe handling faster and safer than ever before. The segments move at all times perfectly parallel with the tubing. The parallel slips provide a stronger grip than the conventional wedge design and will not gouge or score the tubing.

A single lever actuates the slips and they may be locked in either "open" or "closed" position. All segments are held in alignment with the tubing at all times and true radial closure is obtained.

The assembly is hinged and may be placed around the tubing without breaking a joint and may be used on wellhead fittings or set in the rotary bushing.

For complete information write for Bulletin 23151.

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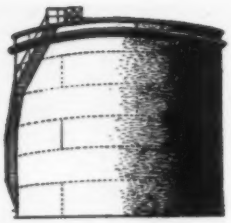

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DAM BLOCKS WATER, SLUDGE. REMOVABLE FOR EASY FLUSHING

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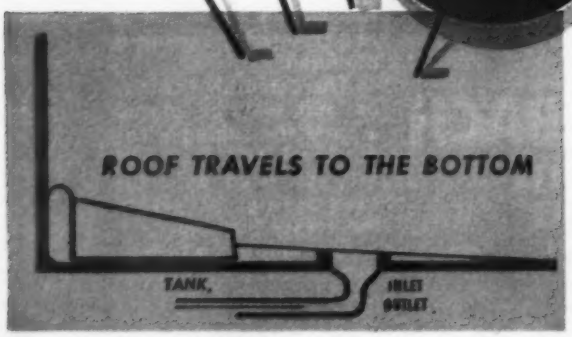
Only a General American patented Wiggins Lodek can offer you this new *Full Travel* . . . this 100% use of capacity.



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JOURNALLY Speaking

Here's Your Chance

(Oil-Opportunity Dept.)

To Proprietor and Director, The Oil and Gas Journal.

Having heard by the Union Government of Burma to handle Foreign countries in which people will pull on with the holders of approval certificates in the month of August 1950.

There are being five main oil streets in Burma and in between the second and third line I propose to drill wells within 4000 feet where there finds gas and crude flowing. There will be no expenses much being too near to the main road. No forest and no firewood obtainable is closed to water.

Labourers:

Concerning in the labours there are many learned and acquainted workers for all sorts of work in office and in works to be constructed.

There is a place and a good plot in near a town 35 miles away from the field where we can be able to start with refining oil and stilling for petrol plants. I have a way to river side 60 miles away, more expenses and bad road.

I have an idea to drill an oil well on my request to get approval certificate in Government of Burma. But there seemed no help in approaching with the Burman people and wherefore I should request the help for everything with you. Such as in all concerns to follow the objectives. So I shall have to allow in sharing prospecting fields suggested in my approval certificates and that you will need Cash and Tools etc. and management.

If agreeable you will consider favourably to communicate here in Burma with the consent of the Government through my opinions.

If one in success with there will be plenty to accompany after starting these business.

A Plan to be constructed:

In Rangoon we shall have to build a refinery, workshop etc. a place 300/400 miles in short cuts roads.

Materials:

No.:—

1. Wolfrum
2. Brass
3. Copper
4. Sulphur Blue Stone
5. Arsenic 5 sorts
6. Tin Ore
7. Blue water
*8. Silver and lead in a hill
9. Golden Steel
10. Yellow Oppamin
11. Yellow Golden Oppamin
12. Mica
13. Sold-field

*We cannot put in chemist of what silver and lead.

The 13 material we will consider later after we ran a business of oilfield, holding a general mining Company etc. etc.

In the time of the consequence I have to request to you proprietor to consider this case favourably and if you do fail to consider you will kindly see your way to let any of your friends willing to undergo on these.

Soliciting your favourable orders to the following address.

Signed:

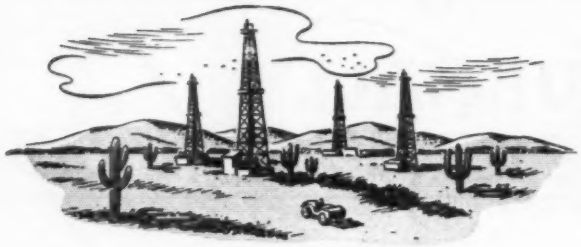
Tha Khin San
C/O Ko Khin- Ma Mya Lay,
No. H.C.95 Clerks' Quarters
Near B.O.C. Football ground,
Chauk,
Magwe District, U.B.

A.P.I.—O.G.J.

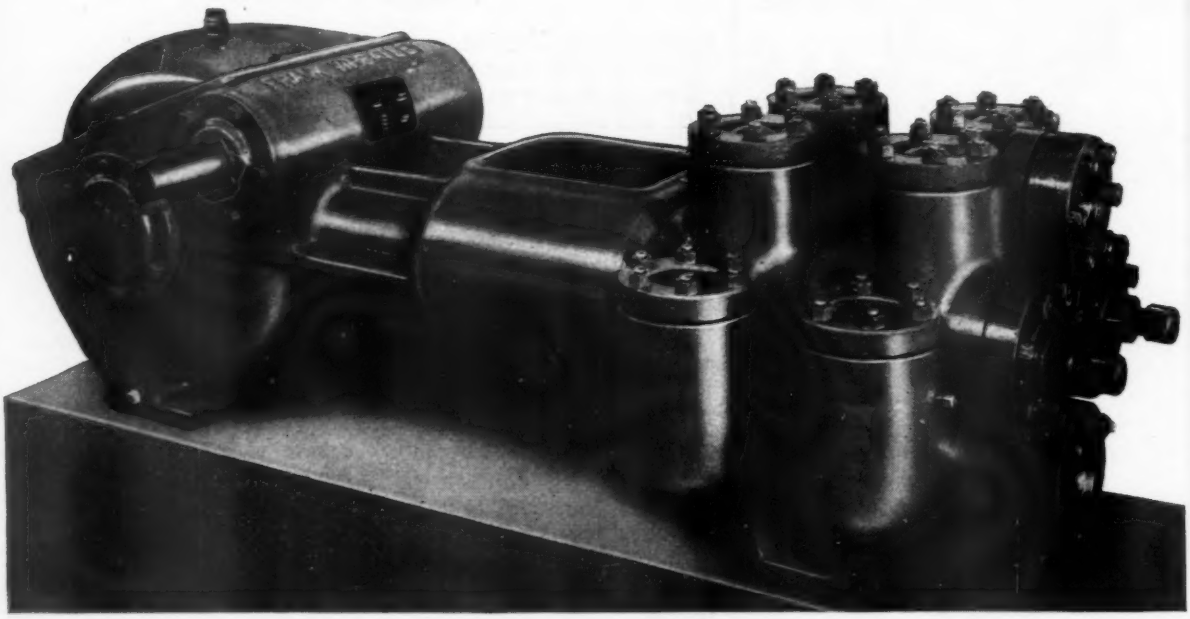
THE thirtieth annual meeting of the Amerian Petroleum Institute at Los Angeles added up to 5,512 registrants (this year, for the first time, the ladies attending the convention registered—746 of them).

Our favorite oil publication also was much in evidence, what with the "special California issue" of November 9 and the big annual A.P.I. number of November 16—420 pages worth—plus several thousand copies of the Journal's special daily booklet listing all A.P.I. registrants.

It seems that one interested party later wanted some additional A.P.I. information, so he addressed his letter to "American Petroleum Institute, Houston, Texas." Maybe it was the accumulative effect of all the big yellow books mentioned above—anyway, the Houston post office marked the letter "Try—c/o The Oil and Gas Journal, Box 1260, Tulsa, Oklahoma."



NICKEL-MOLYBDENUM CAST IRON provides essential strength, wear-resistance and pressure-tightness in cast components of this Figure 7024 Wheatley Power Pump, produced by Frank Wheatley Pump & Valve Mfr., of Tulsa, Okla. With 2½‴ liners, this unit delivers 657 b.p.d. against pressures ranging up to 1190 p.s.i. With 4″ liners, it delivers 3009 b.p.d. against pressures up to 450 p.s.i. These capacities are based on a crankshaft r.p.m. of 70, but the unit will run efficiently at 100 r.p.m. with a corresponding volume increase.



HOW NICKEL CAST IRON HELPS NEW HEAVY-DUTY PUMPS

Handle Greater Volume and Pressures

This heavy-duty Wheatley pump shows how nickel alloyed iron castings render basic economies to users . . .

To secure strong castings with a dense, close-grained structure, that permits this pump to handle greater volume and pressures, Wheatley engineers use a cast iron containing approximately 1% nickel and 0.75% molybdenum.

All parts cast in this material provide improved erosion resistance as well as increased pressure tightness . . . *without need of surplus bulk for strength.*

Throughout industry, nickel cast irons spell economy when you need strength and resistance to corrosion and erosion, or where savings in section and weight are important.

EMBLEM OF INCO SERVICE

Because of unusually heavy industrial and defense demand, rationing of nickel has been in force since July 1st. However, we believe that dissemination of technical data and service experience can help to promote the intelligent utilization of critical materials, so essential in these times. We shall, therefore, continue to issue information on new developments and user experience with nickel-containing materials.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

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VOL. 49, NO. 32

December 14, 1950

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NEWS

Oil-Storage Capacity Near 910,800,000 Bbl., NPC Says 53
Munitions Board Studies Fuel-Consumption Pattern 54
Justice Department to Safeguard Competition 56
T.G.T. Says Gas Will Flow to New England by Labor Day, 1951 57
Conservation Endangered by Bureaucratic Controls, Shivers Says 58
Demand for All Oils in 1951 Estimated at 7,162,000 Bbl. Daily 58
Industry Prepared to Meet Demands, Tide Water President Predicts 59
Imports Show Gain, Average 886,000 Bbl. Daily During October 59
First of Several Modified T.C.C. Units in Operation at Beaumont 60
California Research Using Experimental Rig 61
Polymerization Unit Completed at General's Torrance Refinery 62
Nevada's Deepest Test Completed Dry at 10,314 Ft. 63
Supreme Court Makes Final Ruling in Tidelands Gas 63
Tests Prove Petroleum Coke Can Be Substituted for Coke from Coal 64
Action on Proposed Peruvian Oil Law Put Off Until Spring 67
Competition Brings Sidon Crude Price to Common Level 68
Initial Work Under Way on New Kent, England, Refinery 68
ECA May Cut Allotment to U.K. Due to Country's Recovery 69

ENGINEERING-OPERATING

Transport in Venezuelan Operations 76
Practical Application of MicroLogging 80
Water Flooding in Weber Pool, Washington County, Oklahoma 90
Let's Drill Some Wildcats! 97
First Electric-Welded Vessels Complete Quarter Century 101
Future Oil Provinces—Southwestern United States 102
Skelly Treats 600° Distillate With Cupric Chloride Slurry 107
Progress in Metals 109
The Refiner's Notebook—Tri-Act Control Settings 111
Oil and Gas Equipment Digest 113

EXPLORATION-DEVELOPMENT

Wildcats Attack Beckham Area Puzzle 137
Highlights of Week's Developments 137
Reports by Areas Start on Page 138

DEPARTMENTS

They Say 40
Calendar of Events 42
Journally Speaking 47
Editorial 51
This Week 52
Watching Washington 55
International News 67
Personals 71
Deaths in the Industry 75
Pipe-Line News 117
Pipe-Line Construction 121
Natural-Gas News 127
Refining News 128
Drilling Contractors 132
Exploration Statistics 156
Production Statistics 157
Refining Statistics 158
Market Statistics 159
Equipment Men in News 161
Classified Advertising 164
Advertisers' Index 167

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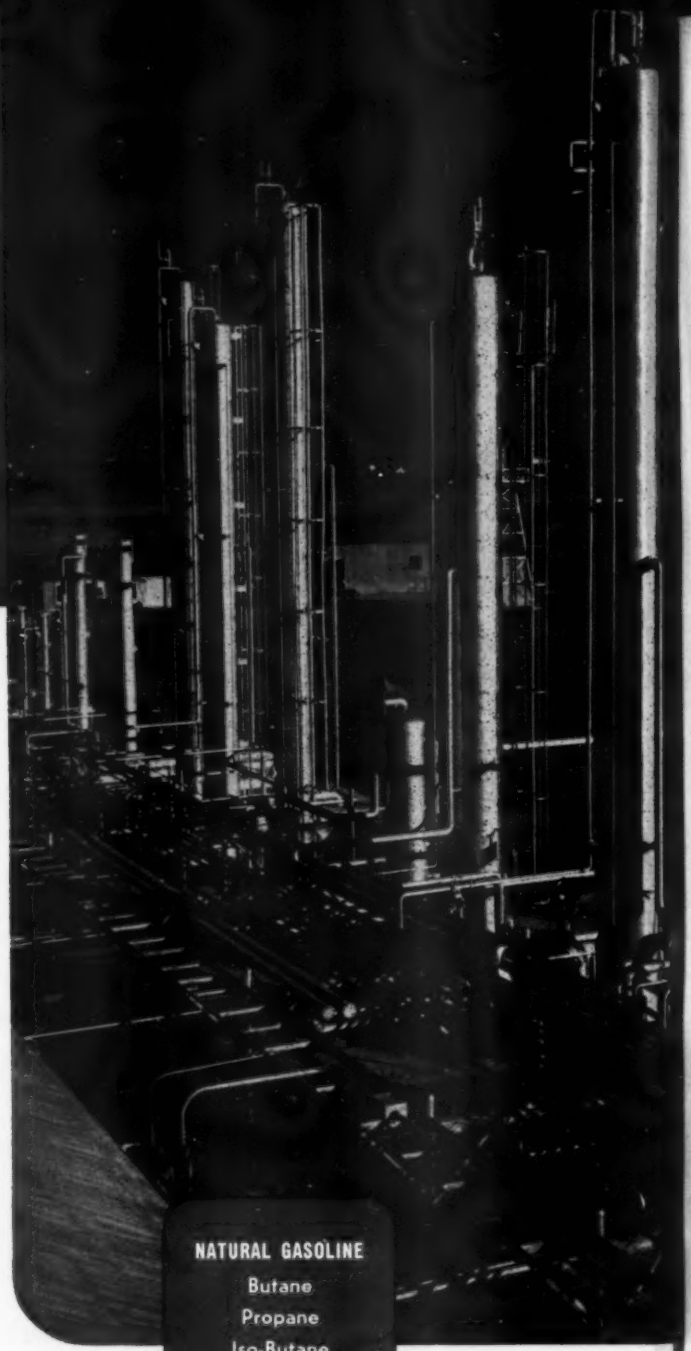

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Crude Oil, Natural Gasoline and Liquefied Petroleum Products

To Oil a War

If the petroleum industry is to oil another war there must be more careful planning and more belt tightening than in World War II. The plans and programs which got us through then will not meet the increased military and essential civilian demands for petroleum products of World War III.

There are only two ways to get oil for war: Take it out of the ground or take it out of civilian consumption. Both are more difficult now than during the last war.

At the time of Pearl Harbor the United States had a reserve crude-producing capacity of about a million barrels a day. This gave us a maximum possible production 24.6 per cent higher than our total demand including natural-gas liquids. This made it unnecessary to do much drilling during the early part of the war.

The steel which might have gone into drill pipe was diverted to construction of facilities for aviation gasoline, synthetic rubber, and oil transportation. Drilling was cut to a point where it barely sustained capacity. During the last few months of the war period production was only about 4 per cent greater than the estimated potential for 1940, even with many fields operating above their efficient rates.

Today reserve crude-producing capacity is somewhat less in barrels and considerably less in percentage than 9 years ago. The total potential, including natural-gas liquids, is about 7,100,000 bbl. per day, which is only 5 per cent above current total demands and about equal to the requirements forecast for 1951.

Just how much oil was made available to the military by civilian rationing during the last war has never been calculated closely. Another war might take more in barrels but less in percentage. This is because postwar gains in demand have been greatest in uses which will be hardest to cut.

Domestic demand for all products increased 78 per cent during the 1940-50 period. The use of heavy fuel, which to a large extent can be supplanted by coal, increased only 61 per cent. On the other hand, demand for distillates increased 143 per cent, and this includes home-heating and diesel fuels which offer only limited possibilities for wartime curtailment.

Gasoline consumption, which suffered the heaviest wartime rationing, has increased 69 per cent. But now a larger percentage of the gasoline consumption would have to be classified as essential. While the number of passenger cars has increased 38 per cent in the past decade, trucks and buses have increased 70 per cent and farm tractors 150 per cent.

The chief oil problem in another war will be production. This means manpower, steel, and equipment for exploration and drilling. The industry, its Washington spokesmen, and the Government must plan for a drilling program greater than any in the past.

THIS WEEK

CONTROLS—President may declare state of national emergency, paving way for all-out control of industrial activities, prices, wages. . . . Under declaration, PAD's authorities would be supplemented by powers to recall to government service all surplus plants of last war which were sold or leased to civilians. . . . ¶Price controls not expected immediately, but quick stiffening of controls on nonessential use of scarce metals and chemicals expected as NPA moves to strip industry down for all-out mobilization. . . .

WASHINGTON—Munitions Board studying possible wartime pattern of fuel consumption. . . . ¶House passes excess-profits-tax bill. . . . ¶Justice Department to keep vigil during defense-production program to halt any elimination of competition. . . . ¶Consumption of copper cut 15 per cent during first 2 months of 1951. . . . ¶Munitions Board criticized on stockpiling program, disposal of surplus war plants. . . .

STORAGE—NPC reports total primary petroleum-storage capacity in neighborhood of 910,800,000 bbl., including 24,344,000 bbl. scheduled for completion by end of this year. . . . This is an increase of 50,918,000 bbl. over the 859,866,000 bbl. as of March 31, 1948. . . .

TIDELANDS—Supreme Court terminates legal proceedings in Texas, Louisiana tidelands cases, denying states' petition for rehearing and approving, with but one exception, decree suggested by Department of Justice. . . .

INDUSTRY—Penn Grade crude prices increased 15 cents per barrel. . . . ¶Gulf Coast natural gas will flow to New England by Labor Day, 1951, T.G.T. head predicts. . . . ¶Total demand for all oils in 1951 estimated at 7,162,000 bbl. daily. . . . ¶Imports averaged 886,000 bbl. during October, an increase of 63,000 bbl. daily over September average. . . . ¶Phillips Petroleum president calls for increase in price of crude oil. . . . ¶Supreme Court rules Oklahoma within authority in setting minimum field prices for natural gas. . . . ¶California Standard to import Borneo crude to aid in meeting military, civilian demands. . . . ¶Texas governor tells Compact Commission that proposed federal regulation of "end use" of oil and gas endangers effective state conservation. . . .

ACTIVITY—Crude production for week ended December 9 averaged 6,666,025 bbl. daily compared with 5,760,350 bbl. daily for previous week. . . . ¶Total completions moved back up to 842 wells for the week compared with 765 for previous week and 835 for same week last year. . . . Wildcat completions increased 46 wells to 193 for the week. . . . ¶Rotary rigs operating in United States on December 4 decreased 2 rigs to 2,375. . . .

TRENDS—Demand for major products at refineries for 4-week period ended December 2 was about 6 per cent greater than in same weeks of 1949. . . . Gasoline was up almost 4 per cent. . . . Kerosine increased 6 per cent. . . . Distillate fuels gained 18 per cent. . . . ¶Demand for residual from domestic refineries was unchanged from last year, but increased imports raised total demand about 10 per cent. . . .

EXPLORATION—California Research Corp. using experimental rig in investigating completion methods, drilling-fluid effects. . . . ¶Nevada's deepest wildcat test completed dry at 10,314 ft. . . . ¶New world's producing depth looms as Standard of California nears completion of test at 15,550 ft. . . .

INTERNATIONAL—Action on proposed Peruvian oil law which would open country to renewed exploration put off until early next spring. . . . ¶Competition brings price of Middle East crude oil at Sidon terminal down to common level. . . . ¶Initial work starts on new refinery at Kent, England. . . .

MISSISSIPPI MYSTERY.—Gulf Coast operators would give an eye tooth for the log of this well in the middle of a big tung orchard on the Wiggins uplift in Stone County, Mississippi, the George Vasen 1 Tung Oil Corp. Now near 19,400 ft., it is already the second deepest hole in the world and still going, coring all the way. Rumors are that the well has revealed some highly interesting geological information, but Vasen, shown examining his 164th consecutive core, will say nothing except that he is after oil, not a record.

Oil-Storage Capacity

NPC sets primary total in U. S. at near 910,800,000 bbl., representing increase of 50,918,000 bbl. over 1948

Bertram F. Linz

WASHINGTON.—Total primary petroleum-storage capacity of the United States is in the neighborhood of 910,800,000 bbl., including 24,344,000 bbl. scheduled for completion by the end of this year, it was calculated last week in a report by the National Petroleum Council committee on storage capacity headed by L. S. Wescoat, president of the Pure Oil Co.

This total will represent an increase of 50,918,000 bbl. over the 859,866,000 bbl. found by the same committee in an earlier study of capacity as of March 31, 1948.

The accompanying Table 1 shows how capacity was increased for crude, clean products, and residual fuel between March 31, 1948, and June 30, 1950, (excluding the 24,344,000 bbl. scheduled for completion during the last half of this year), by districts.

One of the most interesting findings of the two studies is the extremely large storage capacity indicated as necessary to maintain normal flexibility of industry operations as compared with the crude and products actually in storage, the committee pointed out.

1948 survey.—The 1948 survey showed there was an average of 100 bbl. of storage capacity to every 41 bbl. of petroleum inventories. At that time, the close of the tough 1947-48 winter, there were indications that inventories were at lower-than-normal levels in several districts. However, the most recent survey shows an average of 100 bbl. of capacity to every 45 bbl. of inventories, a relatively small difference.

"In no sense is the difference in these inventories and capacity figures an indication of usable storage space," the committee explained. "If the industry is to operate normally, field and refinery tank farm as well as terminal and other distribution facilities must be completely flexible if refinery operations including the blending of the many and varying grades of crude oils available and shipments to primary distribution and consuming points are to be carried on efficiently and on schedule. Also the large number of different grades and specifications of finished products that must be carried is another reason that tends to make the relationship of tankage capacity to actual stock appear to be on the high side, but every situation that demands so many different grades and specifications of products also demands increased tankage with which to handle and distribute these products in a business-like manner. Long-time operating experience in the past has indicated that anything higher than 70 per cent product-tankage relationship will begin to develop handling and distribution difficulties, while in processing establishments even a considerably smaller relationship sometimes causes operating problems."

Big differences.—Not only is there a big difference between storage capacity and oil in storage, the report disclosed, but there is also a big difference between the oil storage and the amount available.

In the case of crude, of which there was 184,655,600 bbl. in the 432,318,000-bbl. capacity last June, 63.3 per cent represented unavailable stocks, the committee found. These unavailable stocks included 400,000,000 bbl. in transit, made up of the 36,000,000 bbl. required to fill tank-farm and main-trunk pipe lines, and almost 4,000,000 bbl. as average to fill for tankers, barges, tank cars, and trucks in operation; and over 100,000,000 bbl. required to assure continuous operation of pipe lines and refineries and the handling and blending of the many grades of crudes produced and processed in the United States.

Clean products.—In clean products, of which 170,519,000 bbl. was in 348,064,000 bbl. of storage capacity, 41 per cent was unavailable, including about 10,000,000 bbl. required for pipe line, tanker, barge, tank car, and tank-truck fill, and 7,000,000 bbl. necessary as clean product pipe-line operating reserves, and 57,000,000 bbl. necessary to assure continuous operation of refinery, terminal, and other distributing facilities.

Resid.—There were 39,231,000 bbl. of residual fuel oil in 106,058,000 bbl. of storage capacity of which 16,232,000 bbl., or 40 per cent, was unavail-

TABLE 1—COMPARISON OF TANKAGE CAPACITY REPORTED JUNE 30, 1950 VS. MARCH 31, 1948
(Figures do not include new tankage shown in Table 4)
(Thousands of barrels)

	Crude oil* (includes all crude categories except producers' storage)		Clean products* (gasoline, kerosine, and distillate fuels)		Residual fuel* (residual fuel oils only)	
	1950	1948	1950	1948	1950	1948
District 1	30,196	26,864	90,337	79,424	17,980	15,030
District 2	122,633	120,619	101,615	87,925	12,814	13,231
District 3	196,095	191,125	88,551	84,227	16,150	16,639
District 4	18,482	18,525	11,036	7,669	1,942	1,889
East of Calif.	367,406	357,132	291,538	259,244	48,886	46,789
District 5	64,912	59,595	56,526	60,515	57,172	76,592
Total U. S.	432,318	416,728	348,065	319,760	106,058	123,381

*California and United States totals not entirely comparable due to changes in method of reporting in California. Figures for the latter area includes reservoir storage as follows: Crude: 1950, 11,733 bbl.; 1948, 2,525 bbl. Residual: 1950, 20,309 bbl.; 1948, 41,574 bbl.

TABLE 2—ANALYSIS OF ACTUAL AND UNAVAILABLE CRUDE-OIL INVENTORIES AND TANKAGE, JUNE 30, 1950
(Thousands of barrels)

	Actual B. of M. June 30, 1950 (1)	Questionnaires returned: Total (2)	Questionnaires returned: Per cent (3)	Unavailable in Column 2: Total (4)	Unavailable in Column 2: Per cent (5)	Tankage June 30, 1950: Capacity reported (6)	Tankage June 30, 1950: Amount in tanks (7)
Inventories at Refineries, in Pipe Line and Tank Farm and in Transit Thereto							
District 1	19,153	19,591	102.3	12,226	62.4	30,196	16,646
District 2	64,616	65,421	101.2	41,245	63.0	122,633	48,166
District 3	101,768	99,033	97.3	68,048	68.7	196,095	82,399
District 4	9,916	10,182	102.7	3,697	36.3	18,482	8,885
District 5	30,692	30,721	100.1	17,224	56.1	*64,912	28,560
Total U. S.	226,145	224,948	99.5	142,440	63.3	432,317	184,656
Producers' Lease Stocks—No Analysis Requested—Considered Operating Stocks (Shown as reported by U. S. Bureau of Mines)							
Total U. S.	16,142	16,142	100.0	16,142	100.0	(†)	16,142
Total all Crude-Oil Stocks—Bureau of Mines							
Total U. S.	242,287	241,090	99.5	158,581	65.8	(†)	200,798

*Includes 11,733 bbl. of reservoir storage assigned to heavy crude oil on June 30 last. †Not available.

TABLE 3—ANALYSIS OF ACTUAL AND UNAVAILABLE CLEAN-PRODUCT INVENTORIES AND TANKAGE, JUNE 30, 1950—INCLUDES GASOLINE, KEROSINE AND DISTILLATE FUEL OILS

(Thousands of barrels)

B. of M. refining dists.—	Actual B. of M. June 30, 1950 (1)	Questionnaires returned Total (2)	Questionnaires returned Per cent (3)	Unavailable in Column 2 Total (4)	Unavailable in Column 2 Per cent (5)	Tankage June 30, 1950 Capacity reported (6)	Tankage June 30, 1950 Amount in tanks (7)
Includes Inventories at Refineries, Terminals, Pipe Lines, and in Transit Thereto							
East Coast	47,140	44,617	94.6	21,465	48.1	85,001	39,604
Appalachian:							
District 1	3,121	2,694	86.3	1,030	38.2	5,337	2,355
District 2	1,215	1,510	124.3	665	44.0	3,971	1,352
Ind., Ill., Ky.	35,430	34,652	97.8	13,434	38.8	69,118	32,983
Okla., Kans., Mo.	18,042	14,667	81.3	5,141	35.1	28,526	13,623
Texas Inland	4,673	4,403	94.2	2,239	50.9	8,604	3,866
Texas Gulf	28,269	27,572	97.5	10,764	39.0	56,797	27,178
Louisiana Gulf	11,693	11,441	97.8	3,307	28.9	17,810	11,266
No. La.-Ark.	3,222	2,378	73.8	739	31.1	5,005	2,295
New Mexico	170	181	106.5	81	44.8	333	176
Other Rocky Mountain	6,544	6,863	104.9	1,670	24.3	11,036	6,723
California	29,351	29,617	100.9	13,417	45.3	56,526	29,098
Total U. S.	188,870	180,595	95.6	73,952	41.0	348,064	170,519

TABLE 4—ANALYSIS OF ACTUAL AND UNAVAILABLE RESIDUAL FUEL-OIL INVENTORIES AND TANKAGE, JUNE 30, 1950

(Thousands of barrels)

B. of M. refining dists.—	Actual B. of M. June 30, 1950 (1)	Questionnaires returned Total (2)	Questionnaires returned Per cent (3)	Unavailable in Column 2 Total (4)	Unavailable in Column 2 Per cent (5)	Tankage June 30, 1950 Capacity reported (6)	Tankage June 30, 1950 Amount in tanks (7)
Includes Inventories at Refineries, Terminals, Pipe Lines, and in Transit Thereto							
East Coast	10,031	10,080	100.5	4,737	47.0	17,602	9,435
Appalachian:							
District 1	261	223	85.4	83	37.2	378	222
District 2	162	166	102.5	53	31.9	372	146
Ind., Ill., Ky.	3,533	3,738	105.8	1,131	30.3	8,611	3,673
Okla., Kans., Mo.	1,196	1,357	113.5	526	38.8	3,831	1,355
Texas Inland	737	663	90.0	245	37.0	1,969	663
Texas Gulf	4,140	4,042	97.6	1,398	34.6	10,317	4,016
Louisiana Gulf	1,868	2,021	108.2	413	20.4	3,457	1,984
No. La.-Ark.	154	155	100.6	20	12.9	308	155
New Mexico	35	31	88.6	17	54.8	99	30
Other Rocky Mountain	652	710	108.9	236	33.2	1,942	710
East of California	22,769	23,186	101.8	8,859	38.2	48,886	22,389
California	17,355	17,384	100.2	7,373	42.4	*57,172	16,842
Total U. S.	40,124	40,570	101.1	16,232	40.0	106,058	39,231

*Includes 20,309 bbl. of reservoir storage.

TABLE 5—ANALYSIS OF TANKAGE UNDER CONSTRUCTION AS OF JUNE 30, 1950, AND SCHEDULED FOR COMPLETION BY OR BEFORE DECEMBER 31, 1950

(Thousands of barrels of new capacity)

B. of M. refining dists.—	Crude oil	Clean products	Residual fuel	Total
East Coast	848	5,251	347	6,446
Appalachian:				
District 1	7	222	.....	229
District 2	.....	74	.....	74
Ind., Ill., Ky.	3,019	4,286	704	8,009
Okla., Kans., Mo.	2,298	803	423	3,524
Texas Inland	1,494	43	390	1,927
Texas Gulf	1,414	116	.....	1,530
Louisiana Gulf	.....	.....	.....	.....
North Louisiana-Arkansas	215	93	.....	308
New Mexico	5	35	.....	40
Other Rocky Mountain	602	812	197	1,611
East of California	9,902	11,735	2,061	23,698
California	294	235	117	646
Total United States	10,196	11,970	2,178	24,344

Note: The above tankage is located at refineries, along pipe lines, at tank farms and at bulk terminals within the same definitions which apply to the inventory figures and the tankage totals shown in the other tables contained in this report.

able as necessary to keep operating facilities functioning.

Details of storage capacity, inventory, and unavailable stocks are shown for each category, by districts, in Tables 2, 3, and 4.

The new tankage to be completed during the last half of this year includes 10,196,000 bbl. of crude, 11,970,000 bbl. of clean product and 2,178,000 bbl. of residual fuel-oil capacity. An analysis of this construction is contained in Table 5.

Secondary storage.—The committee was asked for information on secondary storage capacity but found it could not work out any feasible plan of developing either the storage capacity of secondary suppliers or the amount of products they have in storage. It did examine such reports of bulk-plant expansion which were available, and came to the conclusion that inventories at those points and in the hands of consumers are in somewhat better position at the present time than they were a year ago.

Fuel Consumption

Munitions Board studying possible wartime pattern

WASHINGTON.—A hint that natural-gas operations might benefit by contacting Munitions Board officials was thrown out this week when it was learned the board is making intensive studies of the possible wartime pattern of fuel consumption.

The board is basing its studies on the possibility that in the event of full mobilization one or more of the three major fuels—oil, coal, and gas—might develop supply shortages, requiring industrial and home consumers to convert from one to another.

So far as can be learned, the natural-gas industry has almost entirely ignored the Munitions Board, probably not realizing the important role that agency plays in mobilization or possibly believing the industry is represented before the board by other federal agencies.

The Munitions Board is an agent of the Secretary of Defense staff with respect to the military aspects of economic warfare; industrial matters, including industrial mobilization, procurement, production and distribution, and many other phases of military planning. It ordinarily secures industry views through the National Security Resources Board, but officials welcome voluntary visits of industry men for the discussion of problems that are under consideration.

Burden cited.—A shortage of any one of the three major fuels would throw an added burden upon the other two. Most likely to be short under emergency conditions is oil, because of its wide direct military use, but natural gas also might run short in some areas where it is used extensively in defense production, and the board is attempting to picture the pattern of shift which would ensue in either event.

As an example of the broad field the board is covering, studies are now going on with respect to the possible reconversion to oil of the Big and Little Inch pipe lines. The general conclusion held in many quarters in and out of military circles is that reconversion is not feasible because of the large numbers of individual and important industrial consumers who would be faced with the problem of converting to other

WATCHING WASHINGTON

Bertram F. Linz

All-Out Controls?

President Truman may declare the country in a state of national emergency before the end of the week, paving the way for all-out control of industrial activities, prices, and wages.

Throughout the early part of the week the President held numerous conferences with administration and congressional leaders, with the former surveying the areas in which quick action was necessary and with the latter testing the extent to which he can depend on support at the Capitol for a program putting the nation on a stark war economy.

Under a presidential declaration of national emergency, the authorities of the Defense Production Act would be supplemented by powers to recall to government service surplus plants of the last war that have been sold or leased under security reservations and regulate transportation, among other things.

There is no expectation that price controls will be imposed immediately, since Economic Stabilization Director Valentine and Price Administrator DiSalle have pointed out it will take 2 months or more to build up the administrative and enforcement staff necessary to such an operation, although it is possible that in the interim selective price controls will be placed on some basic materials which can readily be regulated.

A quick stiffening of controls on nonessential use of important metals, chemicals, and other materials is also expected as the National Production Authority moves to strip industry down for all-out mobilization, but there is no indication at the present time that gasoline rationing is in the cards in the foreseeable future. A shortage of home-heating oils, however, may develop in some areas if recent tough weather conditions are unusually prolonged.

Statistical Blackout

Government statistical information which might be of benefit to an unfriendly power is being blacked out in the interests of national security.

A gradual tightening-up of the release of such material has been under way for several months and has now been made complete by instructions from President Truman to the Budget Bureau to pass on any proposals for the publication of data which may have military significance.

The Census Bureau has been withholding detailed information of exports of certain petroleum products, and the Armed Services Petroleum Purchasing Agency no longer is announcing details of its requirements, and the heads of all departments and agencies have been directed by Budget Director Frederick J. Lawton to restrict publication of any information that might endanger the national security.

No NPC Revamp

No extensive revamping of the National Petroleum Council will be necessary to fit it into the defense set-up—probably not much more than the addition to its membership of a few representatives of the gas industry, including manufactured gas.

Spokesmen for the gas industry will have to be included in the NPC because of the fact that the Petroleum Administration for Defense will control gas as well as oil.

The NPC will take the place of an oil-industry advisory committee and, by controlling its activities so as to avoid any participation in the development of programs requiring concerted action by companies, hopes to be permitted to have a chairman selected from the industry instead of a government man as required under the Defense Production Act for advisory groups.

The industry last week got evidence of its good fortune in securing the creation of a defense agency headed by an industry man with direct access to Secretary Oscar L. Chapman.

Four defense agencies were set up by Chapman, handling, respectively, mines, power, solid fuels, and fisheries, and in each case an Interior Department man was placed at the head of the organization. The mining industry, for one, is very unhappy over the set-up which it sees as interposing a barrier between the industry and the secretary and opening the way for the application of departmental policies of undesirable character over the ineffectual protests of an industry without a spokesman in an influential post.

fuels, the amount of scarce materials that would be required for conversion, and the cost.

Reconversion. — Owners of the lines are understood to be willing to reconvert if the defense situation requires, and equipment for pumping oil is still in place. A survey is being made of this equipment with a view to determining its availability in the event it becomes necessary to build another big oil pipe line from the Southwest to the Middle Atlantic area. It is pointed out that such a line could parallel those built during the last war, since they enjoy a broad right-of-way.

Copper Cutback Ordered

WASHINGTON.—A 15 per cent cutback in the consumption of copper during the first 2 months of 1951, to increase to 20 per cent next March, was ordered last week by the National Production Authority as the tensing situation in Korea indicated that all plans would have to be dropped for the easing of restrictions on the consumption of aluminum and other metals which had been rumored to be under consideration.

At the same time, the NPA warned that despite all efforts there is little likelihood that copper supplies can be increased appreciably in the immediate future, and indicated that end-use controls may have to be resorted to if defense needs are to be met.

"As the defense program expands and more copper is required for military purposes," NPA Administrator William H. Harrison said, "the conservation of copper for those functional uses where substitute materials cannot be employed becomes increasingly important. A variety of uses may have to be limited and studies looking to an order to achieve this necessary conservation are under way."

Under the cutback order, nondefense production and use of brass mill and copper wire mill products will be restricted to the specified percentages of the average of the first 6 months of 1950.

House Passes Tax Bill

WASHINGTON. — An excess-profits-tax bill under which some corporations may have to turn into the Treasury as much as 67 per cent of their earnings was passed by the House of Representatives last week and is now pending in the Senate where administration leaders may seek amendments providing even stiffer rates.

As the House prepared to pass the bill, the ways and means committee secured acceptance of a number of amendments, one of which would allow a return of 6 per cent on equity

and borrowed capital and retained earnings of oil and gas common carrier pipe lines and gas and other publicly regulated utilities.

The bill calls for a 75 per cent levy on corporation earnings, before taxes, in excess of 85 per cent of a corporation's average annual earnings during the best 3 years out of the 1946-49 period. An optional formula is provided which would allow returns before taxes of 12 per cent on the first $5,000,000 of invested capital, 10 per cent on the next $5,000,000, and 8 per cent on capital in excess of $10,000,000; in addition, up to 3 per cent of a corporation's borrowed capital could be counted as part of its investment capital.

In addition to the escape clause for pipe lines and other utilities which is designed to prevent undue hardship, special provision is made for growing companies with low base-period earnings, or losses.

The excess-profits tax would be imposed on top of the regular rates on normal earnings of 25 per cent on the first $25,000 and 45 per cent on the rest. A ceiling of 67 per cent is provided as the maximum a corporation would be required to pay in normal and excess-profits taxes.

The excess-profits tax would apply to all income of a corporation since last July 1.

Defense Watchdog

Justice Department alert to safeguard competition

WASHINGTON. — The Department of Justice will maintain a constant alert over the defense production program with a view to halting any developments which may tend to eliminate competition, strengthen monopoly, injure small business, or promote undue concentration of economic power, President Truman was assured last week by Atty. Gen. J. Howard McGrath.

Reporting on a survey of the defense program required under the Defense Production Act, McGrath pointed out that experience under the law has been too brief to develop any definite pattern of its effect but that there are a number of dangers to competition inherent in a mobilization program.

"It is of crucial importance that the administration of a mobilization program should be consistent with the long-run policies of the American people to maintain a vigorously competitive and progressive economy," McGrath said. "We must, however, face the prospect that it may be necessary to live under an economic system organized for mobilization of an indefinite duration. The economic and governmental institutions that prevail during this period cannot fail to affect our way of life."

Initial stage. — However, he said, it must be recognized that the mobilization effort is still in the initial stage and any recommendation as to specific policies would be premature, but the defense agencies should continually examine the effects of their programs to make the adjustments consonant with the maximum defense effort and the maintenance of competition.

"Throughout any period of mobilization a high civilian standard of living is a substantial, if immeasurable, national asset in maintaining civilian morale," the report commented. "If the requirements of national defense impose a permanent burden on the country's productive resources, the burden should be borne as far as possible by increases in productive capacity. Shortrun declines in living standards are readily accepted where the public appreciates the imminence of danger; they become less tolerable when they are the unnecessary products of inadequate utilization of our capital and human resources.

Administration.—"The entire mobilization program should be so administered as to provide for adequate military programs and at the same time equitably distribute the diminished balance of materials with the civilian economy, expand our capacity of scarce materials to a degree sufficient to handle the requirements of military and civilian demands, and preserve the free-enterprise system with due regard to the special problems of small business, and disruption of industrial operations. Only if necessary emergency controls can give way within a reasonable time to productive capacity adequate to supply both military and civilian requirements can there be any assurance that our economy will remain competitive and free."

Munitions Board Criticized

WASHINGTON. — Sharp criticism of the Munitions Board in the last report of the Senate preparedness subcommittee and even sharper censure expected in another report shortly to be released may lead to reorganization of that branch of the Defense Department.

In his last report, Sen. Lyndon B. Johnson of Texas, chairman of the subcommittee, attacked the board's handling of the stockpiling program and its failure to take effective steps to halt the disposal of surplus war plants after it became apparent last June they might again be urgently required.

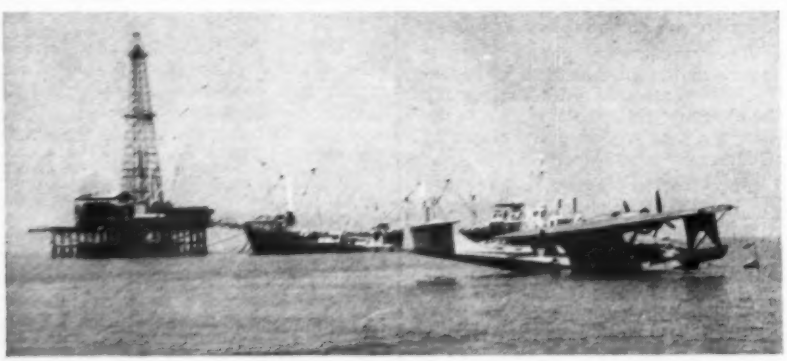
In his next report, Johnson is expected to go even further in exposing deficiencies in the board's operations. The mistakes which the subcommittee has uncovered are of omission rather than commission, and it is not anticipated that they involve oil.

New Lease Forms Due

WASHINGTON.—New oil and gas offer and lease forms differing in major respects from those now in use will be put into effect January 28, it was announced last week by the Interior Department.

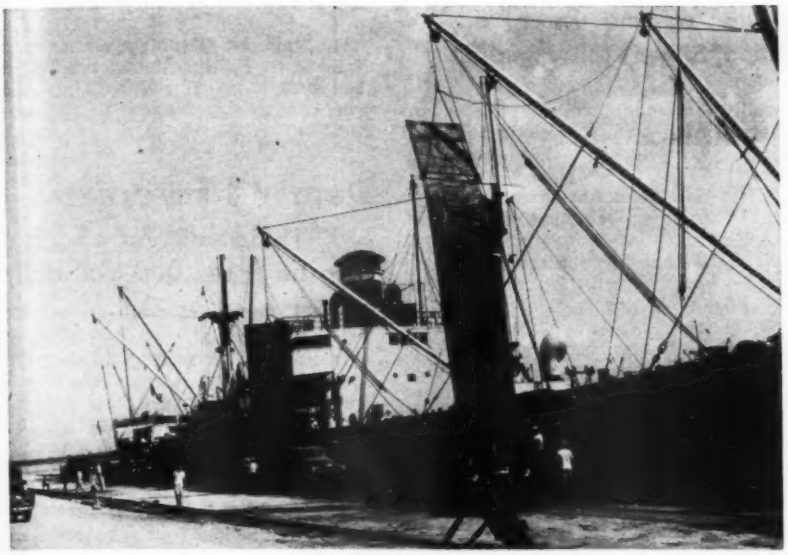
Revision of these forms has been under consideration since October, 1949, and interested parties have been given opportunity to present their views and recommendations, some of which have been adopted by the department.

Bureau of Land Management Director Marion Clawson explained that the forms and accompanying regulations are designed to accelerate the issuance of noncompetitive leases on public domain lands by making the signature of the person offering to lease his signature to the lease, if approved by the BLM.



Seaplane Used in Offshore Work

The California Co. has introduced a new working tool for operations off the coast of Louisiana—a PBY amphibious airplane, which is shown above moored to a buoy near the company's five-well drilling platform at Main Pass. A converted LST is near by (center), and small boats are used to handle passengers and move cargo to and from the airplane. Use of the plane enables supervisory personnel to cover the entire offshore operations in a minimum of time.



This high-grade Dutch steel plate shown during unloading from an Italian ship at Galveston, Tex., is destined to be a part of Tennessee Gas Transmission Co.'s 1951 construction program. Part of a 40,000-ton order, the steel plates are being converted by Kane Pipe Corp., Galveston, into approximately 152 miles of 30-in. diameter pipe.

Gas for New England

T.G.T. president says Gulf Coast fuel will flow into area by Labor Day, 1951; line work to begin in spring

Leigh S. McCaslin, Jr.

HOUSTON.—Gulf Coast natural gas will be flowing to New England by Labor Day, 1951, Gardiner Symonds, president of Tennessee Gas Transmission Co., told the Boston Security Analysts Society last week.

Tennessee Gas and its subsidiary, Northeastern Gas Transmission Co., were granted a Federal Power Commission certificate on November 8 to supply gas to a part of the New England market. (Transcontinental Pipe Line Corp. will assist Tennessee Gas in supplying Northeastern's needs.) Under the order, Northeastern will serve certain markets in Massachusetts and Connecticut, and southern New Hampshire. The remaining markets in Massachusetts and Connecticut, all of Rhode Island, and one company in New Jersey are reserved for Algonquin Gas Transmission Co. *(The Oil and Gas Journal, November 16, 1950, page 194.)*

Symonds reported that his company has, with only 4 weeks elapsed since it was granted a certificate, completed all surveying for extending its existing line from Buffalo to the Massachusetts state line. Also, more than half of the right-of-way has been acquired and the remainder will be obtained before the end of February. Actual construction work is scheduled to start "as soon as favorable weather arrives in the spring."

Northeastern survey.—The surveying of Northeastern's pipe-line system is well under way and a considerable amount of the right-of-way has been obtained, the Tennessee Gas president said. As to pipe, the steel mills have given delivery commitments on all pipe required by both Tennessee and Northeastern. Some steel has already been received and more is expected next month. All 1951 pipe will be received by the end of the second quarter, according to Symonds.

The Tennessee president was optimistic about getting pipe despite the tense international situation. He pointed out that "the steel pipe for our original line, built during the last war, was assigned to us under a Triple-A priority by the War Production Board. Undoubtedly, under another emergency situation, the vital importance of natural-gas systems to the defense effort will again be recognized."

Dutch plate.—In an effort to bolster its pipe supply, Tennessee Gas is importing steel plate from Holland. The company has 40,000 tons of plate on order, some of which has already been received at Galveston, Tex. It is being converted into 30-in. diameter steel pipe by the Kane Pipe Corp. The total order will provide the company with approximately 152 miles of the large-diameter pipe.

Company officials attach no special significance to the use of European steel. They say that the huge 1951 construction program of Tennessee Gas makes it imperative to utilize every possible source of steel. This is particularly true in view of the anticipated enormous domestic demand for steel during the coming year to supply the defense effort. The price of the pipe made from the Dutch steel will be comparable to that made from the domestic product.

T.G.T. desire.—Symonds reiterated the position of his company in desiring to serve the entire New England market, despite the fact that the current FPC ruling splits it. He said Tennessee proposes to do this by providing "better service to the public."

"It intends to have an available supply of natural gas in New England long before anyone else. With natural gas in New England, there is little reason to withhold the use of natural gas from a specified portion of the consuming public in order to satisfy the delaying desires of the competing fuel interests."

Long-range plans.—Tennessee's long-range plans to provide a supply of natural gas to the Toronto, Ont., Canada, area will not prevent it from supplying more of the New England market, Symonds told the security men. He said that capacity and sales can be "substantially increased" without a proportionate increase in operating cost. This is because additional parallel lines and increased compressor power still leave only a single transmission system to operate.

Penn Grade Price Boosted

OIL CITY, Pa.—Prices of Pennsylvania Grade crude oil were increased 15 cents per barrel effective December 9, marking the sixth straight increase this year. The six increases total 71 cents per barrel.

The Joseph Seep Agency of the South Penn Oil Co., Bradford, made the announcement of the price increases. Various other buyers of Pennsylvania crude increased their postings 15 cents a barrel.

The new prices follow: Allegany, Bradford, and Middle District, $4.25; Southwest Pennsylvania, $3.82; West Virginia and southeastern Ohio, $3.76.

Zanesville, a Pennsylvania grade which the Seep Agency does not purchase, remained unchanged, but Freedom-Valvoline Oil Co. and Ashland Oil & Refining Co. of Ashland, Ky., are expected to announce a price increase.

Conservation Endangered

Advocation of federal regulation of 'end use' of oil, gas endangers state conservation, Shivers tells compact

Leigh S. McCaslin, Jr.

HOUSTON.—Gov. Allan Shivers of Texas opened the annual winter meeting of the Interstate Oil Compact Commission here this week with the admonition that "effective state conservation" is in danger from those who propose federal regulation of the "end use" of oil and gas.

Shivers said that this "preposterous idea is being seriously advocated again in the high counsels of our federal Government." In particular he pointed to the Senate interior committee which is currently making a study of the fuel supplies of the country. This study, the governor said, is directed toward drafting a policy for regulating how and where fuels will be used.

The most "apparent" motives for controlling the end use of oil and gas, Gov. Shivers said, are: "(1) To create a fuel dictatorship. (2) To manipulate fuel uses to the advantage of the coal industry, in its competitive race with oil and gas."

Conflicting policy.—The Texan told his audience that a policy of "end use" control "conflicts not only with the economic welfare of our section of the country, but the inevitable weakening of the effectiveness of our conservation laws wherever they would run counter to such a federal policy."

He told the compact members that "it takes little prodding of the imagination to visualize what would happen to correlative rights and the sound engineering principles of production in pools where the amount of oil taken by any one producer would hinge not on conservation considerations, not on market demand, not on any of our present yardsticks, but upon the decision of a federal bureau as to the desirable end use of the oil produced."

Further, he said, the "normal operation of the mechanics of price" would not operate. Also, he expressed doubt that the federal Government would "seriously regard" the experience of the state regulatory bodies.

Drillers warned.—A. W. Thompson, Houston contractor and president of the American Association of Oilwell Drilling Contractors, warned the drilling industry to prepare for a skilled manpower shortage as well as material shortages in the face of a national emergency. He pointed out the "indifference" toward holding this manpower during World War II, and the resultant difficulties. Thompson predicted that 42,000 to 43,000 wells would be drilled during 1951 and that "the flow of materials and the availability of manpower cannot be interrupted if we are to continue working efficiently at a high operating rate."

The Houston contractor pointed out that manpower demands of the drilling industry are not high by most standards considering the work volume. He estimated that currently operating cable and rotary rigs require 53,200 men for their operation. Thompson said the real concern is to see that these defense industries or skilled men are kept in the industry and not siphoned off to defense industries or the Armed Forces. To accomplish this, he said, "We must not be slow in establishing the importance of our industry. Recognition of our need of trained men to do a job is imperative."

Equipment needed.—In addition to manpower, Thompson elaborated on the need for "an adequate supply of high-quality equipment, including drill pipe and casing." He estimated that the 1951 drilling program would require nearly two million tons of steel. Quantity alone is not enough, he said. The industry requires certain alloy steels of the highest quality. Drilling bits, for instance, require 3½ per cent nickel, a scarce material. Among other materials needed by drillers, which may be in short supply, he said, are tungsten and cobalt for rock bits, rubber hose, wire lines, and chemicals for treating mud.

Commissioner speaks.—On Tuesday, the compact group heard a major address by Lt. Gen. Ernest O. Thompson, Texas Railroad Commission, tracing the 15-year history of the I.O.C.C. The commissioner concluded his discussion with this look at the future: "We enter the new year with crude stocks in balance with the best informed opinions of what is adequate. Somewhere around 240 to 245 million barrels of crude seem adequate. Stocks are well within that range. For the long range we can be assured that by watching changes in stocks of crude and products we can promptly provide the required amount of crude when, where, and as needed. All this can and will be done by the compacting states without waste or harm to the producing reservoirs."

Oklahoma Gas Ruling Upheld

WASHINGTON.—The Supreme Court this week ruled that Oklahoma state officials acted within their authority in setting minimum field prices for natural gas from the Guymon-Hugoton field with the avowed purpose "to prevent waste and protect the rights of the public and those having the right to produce from a common source of supply within the state."

The validity of the regulation was attacked by Phillips Petroleum Co. on the contention it violated the due process of law provisions of the constitution.

Demand Forecast

1951 demand for all oils to be 7,162,000 bbl. daily

TOTAL demand for all oils in 1951 is estimated at 7,162,000 bbl. daily, according to a forecast released by the U. S. Bureau of Mines. This represents a gain of 419,000 bbl. daily or 6.2 per cent over the average for 1950. However, the bureau calls attention to the fact that any forecast for 1951 is extremely uncertain at the present time.

Figures for the first 6 months are expected to approximate actual requirements with variations from forecast levels in the last half depending on world conditions. The demand estimate for the first half represents an increase of 7.1 per cent over same period in 1950.

To meet demand in 1951 crude production at the rate of 5,732,000 bbl. daily will be required or a gain of 6 per cent. Natural-gasoline and cycling-plant output is estimated at 540,000 bbl. daily, up 9.5 per cent. Projected imports, totaling 934,000 bbl. daily, include 556,000 bbl. daily for crude and 378,000 bbl. daily for products, mostly residual fuel.

Domestic demand.—Domestic demand is forecast at 6,923,000 bbl. daily compared with 6,455,000 bbl. daily for 1950. A further decline in exports is expected with the total of crude and products averaging 239,000 bbl. daily compared with 288,000 bbl. daily this year.

The forecast of domestic demand includes gains of 9.5 per cent for gasoline, 9.5 per cent for kerosine, 10 per cent for distillate fuel, 2 per cent for residual fuel, and 5.6 per cent for other products and losses.

Required runs to stills, averaging 6,148,000 bbl. daily, is 7.3 per cent greater than in 1950. It is estimated that this rate will permit an increase in refined-product stocks amounting to 16,000,000 bbl. for the year or 44,000 bbl. daily.

The greatest percentage gain in domestic demand is expected in the first quarter of the year. The increase of 8.1 per cent in this quarter is followed by smaller gains of 7.6 per cent in the second and 6.2 per cent in the third. The fourth-quarter increase is estimated at 7.2 per cent.

Total demand.—Data for 1950, included in the forecast, are based on

SUPPLY AND DEMAND—ALL OILS—BUREAU OF MINES FORECAST
(Thousands of barrels daily)

	1951					
	First quarter	Second quarter	Third quarter	Fourth quarter	Year	Year 1950
Production	6,245	6,253	6,272	6,315	6,272	5,899
Crude	5,706	5,731	5,734	5,755	5,732	5,406
Other oils	539	522	538	560	540	493
Imports	922	912	924	978	934	844
Crude	533	549	565	576	556	490
Refined	389	363	359	402	378	354
New supply	7,167	7,165	7,196	7,293	7,206	6,743
Stock change	—133	+374	+153	—218	+44	....
Crude	....	....	....	....	....	+8
Other oils	—133	+374	+153	—218	+44	—8
Total demand	7,300	6,791	7,043	7,511	7,162	6,743
Motor fuel	2,622	3,187	3,272	3,044	3,033	2,786
Residual	1,722	1,439	1,467	1,641	1,567	1,542
Distillate	1,567	912	924	1,391	1,197	1,099
Kerosine	467	231	261	446	351	321
Other	922	1,022	1,119	989	1,014	995
Exports	256	264	228	207	239	288
Crude	67	88	76	55	72	88
Refined	189	176	152	152	167	200
Domestic demand	7,044	6,527	6,815	7,304	6,923	6,455
Motor fuel	2,567	3,132	3,228	3,000	2,984	2,723
Residual	1,678	1,396	1,435	1,609	1,529	1,499
Distillate	1,533	890	902	1,369	1,172	1,066
Kerosine	461	225	255	440	345	315
Other	805	884	995	886	893	852
Runs to stills	6,100	6,130	6,150	6,210	6,148	5,729
Demand for domestic crude	5,706	5,731	5,734	5,755	5,732	5,397

actual figures for 9 months. Total demand for the year is now estimated at 6,743,000 bbl. daily or 80,000 bbl. daily greater than the total included in the bureau's September forecast. The revision includes additions to the estimate of residual demand amounting to 22,000 bbl. daily. Demand for other products and losses has been revised upward by 44,000 bbl. daily with changes for gasoline, kerosine, and distillate accounting for the other 15,000 bbl. daily.

The classification "other and losses" includes military shipments of crude oil for which data are no longer available. Other deliveries to the armed forces are included in domestic demand by products.

Industry Prepared

Tide Water head predicts oil demands can be met

HOUSTON.—The petroleum industry is better prepared now to meet whatever demands are made on it by the Armed Forces than it was in World War II.

This opinion was expressed here by William F. Humphrey, president of Tide Water Associated Oil Co., at the company's first directors' meeting outside of New York and San Francisco. "It is the feeling of not only our board of directors but key persons in the oil industry that the industry can fulfill every requirement of the armed forces," he said.

Humphrey predicted the United States oil production, which is approximately 6,000,000 bbl. daily at present, would mount toward 7,000,000 bbl. daily in the next few years. "In our own company, we are moving aggressively forward to produce more and more oil," Humphrey said. "We are developing our properties in West Texas and along the Gulf Coast and in Louisiana as fast as we can consistent with sound operating practices in an effort to supply more of the production needed for our refineries at Bayonne, N. J., and Drumright, Okla."

Stressing the fact that the oil industry has consistently supplied the products the public demanded, except for brief spot shortages because of transportation limitations, Humphrey discounted the talk of running out of oil.

Plenty of oil.—"There is no danger of this country running out of oil in the foreseeable future," Humphrey said. "The oil operators, both independents and majors, are aggressive and forward-looking. They will never give up the search for more oil as long as the federal Government does not place restrictions on their operations. The oil industry is now drilling at the rate of 43,000 new wells per year. Of these, there will probably be about 14,000 dry holes, but the oil man has never let a few setbacks discourage him. It's net progress forward that counts."

While tremendous advances have been made in the field of solar and nuclear energy, the Tide Water president said that he did not think that either of them are likely to become direct competitors of oil and gas.

First-hand view.—Humphrey said that the purpose of the first board meeting to be held in Houston was "to give the directors a first-hand view of the company's operations in this area so that they will be prepared for the company's budget meeting in New York on December 18-19."

Before and after the board meeting, Tide Water directors inspected company properties in West Texas, Texas Gulf Coast, South Louisiana, and Oklahoma.

Imports Show Gain

Daily average of 886,000 bbl. set during October

IMPORTS of crude and petroleum products averaged 886,000 bbl. daily for the month of October, according to data of the Department of Commerce. This represents an increase of 68,000 bbl. daily over the average in September and is the highest month since last January when the total was 887,000 bbl. daily. Compared with the same month last year, the increase was 13.7 per cent.

Crude imports averaged 500,000 bbl. daily, also the highest since January. Receipts from Venezuela gained almost 30,000 bbl. daily over September in contrast with slight drops for Colombia and Mexico. Crude from the Middle East remained at about 112,000 bbl. daily with the decrease for Kuwait balanced by an increase for Saudi Arabia.

Products.—Product imports averaged 386,000 bbl. daily, up 52,000 bbl. daily from September. Residual fuel accounted for 45,000 bbl. daily of the increase with the total for the month going above 10,000,000 bbl. for the fourth time this year.

Exports, excluding shipments to territories, were at the highest level so far this year. The average for the month was 308,000 bbl. daily compared with 280,000 bbl. daily in September and 282,000 bbl. daily in April, the previous record-holder for the year. Crude exports increased 42,000 bbl. daily over September, but the decrease of 14,000 bbl. daily in product exports, chiefly residual fuel and lube oils, cut the net gain to 28,000 bbl. daily.

IMPORTS INTO CONTINENTAL UNITED STATES
(Thousands of barrels)

	Oct. 1950	Sept. 1950	Oct. 1949
Crude—			
Mexico	1,017	1,065	544
Colombia	1,130	1,448	920
Venezuela	9,876	8,669	10,910
Kuwait	1,974	2,488	2,062
Saudi Arabia	1,499	863	625
Total crude	15,496	14,533	15,061
Daily average	500	484	486
Products—			
Residual fuel	10,631	8,918	8,711
Other products	1,333	1,087	368
Total products	11,964	10,005	9,079
Daily average	386	334	293
Total all oils	27,460	24,538	24,140
Daily average	886	818	779

EXPORTS*
(Thousands of barrels)

	Oct. 1950	Sept. 1950	Oct. 1949
Crude—			
Crude	4,033	2,654	2,916
Gasoline	1,814	1,849	2,458
Distillate	1,108	905	730
Residual	632	802	817
Lube oils	1,002	1,281	976
Other products	949	914	657
Total all oils	9,539	8,405	8,554
Daily average	308	280	276

*Excludes shipments to territories.

Refining Units

First modified T.C.C. facility is completed

BEAUMONT, Tex.—The first of a number of new modified Thermofor catalytic cracking units is now in full operation at the refinery of Magnolia Petroleum Co. here. The new 15,000 bbl. per day unit was completed early in October following which extensive test runs were conducted on the first unit of a newly modified process. Five other units of similar size are due for completion within the next 6 weeks, as announcements of further new construction were made by Socony-Vacuum Oil Co., Inc., licensors of the process.

A total of 21 modified T.C.C. plants are now completed, under construction, or projected. These units, located here and abroad, total 245,000 bbl. per day in total feed capacity. Socony-Vacuum and its affiliates account for about half of the new capacity being added. The latest unit, of 15,000-bbl. capacity will be built at the company's Paulsboro, N. J., refinery. Unlike other such projects, the Paulsboro unit will be a complete new plant including feed preparation, cracking, fractionation, and gas-recovery facilities. Bids on this newest project are now in, and the award will be announced shortly.

Other units.—In other Socony-Vacuum refineries, seven of the new 15,000-bbl. per day process units are still under construction. Including the completed unit at Beaumont, they are replacing fixed-bed Houdry units, utilizing some of the Houdry facilities but increasing cracking capacity in all cases by 50 per cent.

A second unit at Magnolia's Beaumont refinery will be completed during the last week in December, as will two similar units at the Cleveland refinery of Standard Oil Co. (Ohio). Socony-Vacuum projects at the Trenton, Mich., and Buffalo, N. Y., refineries will go on stream in January and the Augusta, Kans., unit and a third one at Beaumont will follow in March. The Brooklyn project is tentatively scheduled for completion in late spring and the East Chicago installation, now in initial stages, will go on stream in the fall.

New contracts.—Several other new contracts for the new process utilizing gas lift for catalyst and simplified regenerator-kiln design, have been announced recently. Taylor Refining Co. is installing an 8,000-bbl. unit at Corpus Christi, and a similar project is getting under way by Derby Oil Co. at Wichita. Continental Oil Co. has awarded the contract for a 10,000-bbl. unit at Lake Charles, La. A smaller prefabricated unit rated at 6,000 bbl. per day is under way at the Artesia refinery of New Mexico Asphalt & Refining Co. Six units are under construction in Europe totaling about 50,000 bbl. per day. Of these, three are located in Italy, two in Germany, and one in France.

The current construction program on modified T.C.C. compares with the record wartime construction of the original T.C.C. process, also developed by Socony-Vacuum. During the period between announcement of the process in 1942 and the completion of the last unit of the type using mechanical catalyst lift in May 1949, a total of 38 separate T.C.C. units were constructed, totaling a feed capacity of 349,000 bbl. per day.

T.G.T. Plant Progressing

HOUSTON.—Construction is now 45 per cent complete on Tennessee Gas Transmission Co.'s $12,000,000 liquid - hydrocarbon - recovery plant near Greensburg, Ky.

When completed, the plant will process about 750,000 M.c.f. daily of the natural gas passing through the company's transmission system at that point. Expected recovery is 323,000 gal. daily of liquid hydrocarbons. The entire output will be sold to Mathieson Hydrocarbon Chemical Corp., which will further process the hydrocarbons at a new plant now under construction near Brandenburg, Ky., about 35 miles from Louisville. A 65-mile pipe line will carry the liquid-hydrocarbon stream from the Tennessee Gas plant to the $27,000,000 Mathieson installation.

The chemical plant will produce such organic chemicals as ethylene glycol, ethylene oxide, polyglycols, and ethylene dichloride, and such petroleum products as commercial propane, commercial butane, and natural gasoline. The plant's principal product will be ethylene glycol, used principally as an ingredient of antifreeze. It will produce about 10 per cent of the total U. S. supply.

Tennessee Gas' extraction plant is expected to begin operations next spring. The natural gas processed in the plant will be returned to the company's pipe-line system.

Oil-Company Earnings Up

NEW YORK.—Combined earnings this year of 30 leading United States oil companies representing about two-thirds of the domestic industry show an increase of 18.3 per cent over 1949, according to a study prepared by the Petroleum Department of the Chase National Bank.

The department estimated that total earnings of the 30 companies may amount to $1,666,000,000 in 1950, compared to $1,408,000,000 reported for 1949. It pointed out, however, that its estimates were based on tax rates imposed by the Revenue Act of 1950 and do not include any provisions for possible excess profits tax or for year-end adjustments.

The greatest increase in combined earnings of the companies was shown in the third quarter of this year, during which estimated earnings rose some 58.5 per cent above those for the third quarter of 1949. Gross operating income of the group of companies during 1950 was maintained at a high level and may approximate $14,800,000,000 or 8.2 per cent over the $13,675,000,000 derived in 1949, the survey said.

The following table shows the trend of net income of the companies by quarters during the last three years:

	In million dollars			Per cent change 1950 from 1949
	Actual 1948	Actual 1949	Est. 1950	
First quarter	485	384	321	16.4
Second quarter	509	334	385	15.3
Third quarter	465	306	486	58.5
Fourth quarter	470	384	474	23.4
Total	1,929	1,408	1,666	18.3

The survey issued by the bank included a note that the industry expanded its operations during 1950 by a substantial amount, with demand for all oils up nearly 10 per cent. It estimated 1950 crude production at 5,300,000 bbl. daily, a 5.1 per cent gain over the 5,024,000 bbl. daily in 1949. Crude runs to stills this year were placed at 5,700,000 bbl. daily or 6.9 per cent over the 5,330,000 bbl. daily last year. Demand for all oils was estimated at 6,700,000 bbl. daily, up 9.5 per cent from the 6,119,000 bbl. daily in 1949.

Higher Crude Price Sought

NEW YORK.—An increase in the price of crude oil was called for by K. S. Adams, president of Phillips Petroleum Co., Bartlesville, in a statement issued here December 8.

"Increased costs of producing oil are cutting into industry income," Adams said. "Right now it is obvious that all costs of producing crude oil are rising rapidly while the selling price has remained unchanged during a long inflationary period.

"I feel the major problem which confronts the oil industry now is to get its affairs in shape so that it will be able to supply from producing fields in this hemisphere, without any question of doubt, such military and domestic oil requirements as might arise in the event of a full-scale war. This goal cannot be reached under prices presently being received for crude oil."

Adams did not say what the price of crude should be nor did he indicate that his company would take the lead in initiating a price increase. On at least two occasions in the past Phillips Petroleum Co. has attempted to initiate a general increase in the price of crude.

Experimental Rig

California Research Corp. investigating completion methods, drilling-fluid effects with drilling unit

D. H. Stormont

LOS ANGELES.—Methods of completion, and particularly the effects of drilling fluids on well productivities, are being thoroughly investigated at an experimental drilling rig set up at California Research Corp.'s laboratory near here at La Habra, Calif. Research work has been under way only a short time so that the broad field to be covered has barely been scratched as yet.

Current investigations are designed primarily to study various types of muds, methods of removing them from the face of the well bore, and the degree to which the resultant mud cakes restict the flow of oil into the "well." When these and other studies are completed, California Research engineers hope to know much more about what takes place at the bottom of an oil well.

Synthetic pay sand. — Of necessity, certain phases of the work differ from conventional oil-field practices, but wherever possible actual drilling conditions are duplicated. The "pay" involved in current studies is merely a poured, synthetic one but its permeability and porosity, more or less established in advance, are comparable to those found in oil sands. So are its oil saturation and interstitial water content, which likewise can be varied from test to test if desired. Formation pressures dealt with are in the low-pressure range but the pressure differential between them and those exerted by the mud column are representative of oil-field experiences.

A standard 66-ft. derrick was erected for carrying out the "drilling in" phase of the studies. The mud pump and system are full size but the draw works and rotary only faintly resemble conventional drilling equipment. Several other pieces of the rig likewise differ in appearance from conventional equipment but perform similar duties. For example, to obtain proper weights on the bit while drilling, two tons of cast iron weights had to be placed at the top of the kelly.

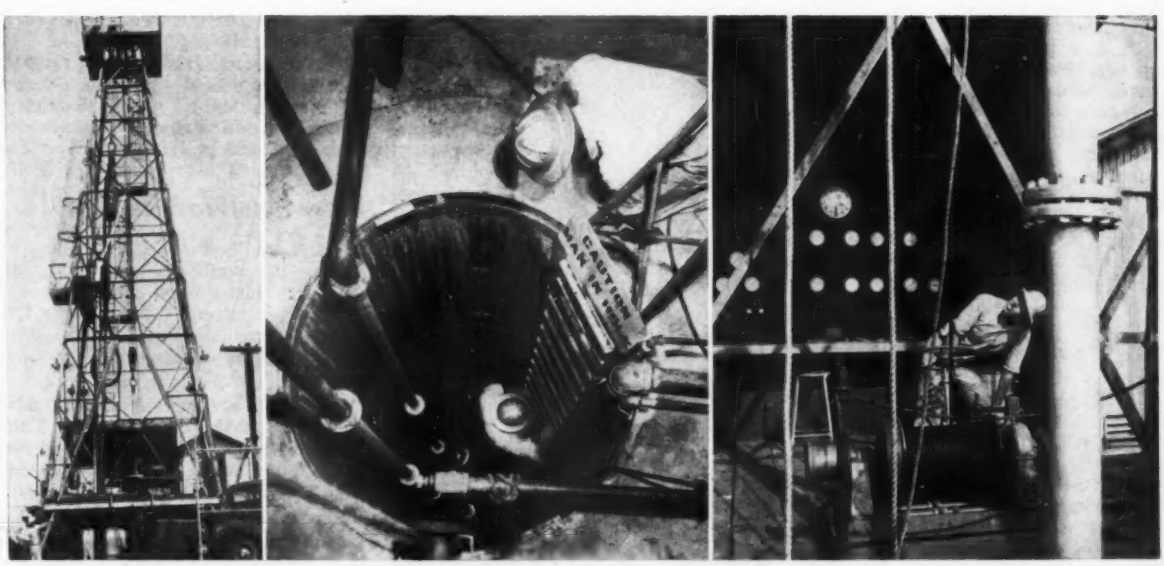
Operations.—The operations are conducted in a steel shaft 54 in. in diameter by 45 ft. deep, plus a 3-ft. sump. Near the bottom of the shaft a pressure vessel is suspended from supports. The synthetic formation to be drilled out and tested is placed inside this vessel. Mud, oil, brine, and vacuum lines connected to the vessel permit the approximation of single-phase oil reservoir conditions as they exist in the few inches immediately around the well bore.

After the pressure vessel containing the sample formation is lowered into the shaft, steel casing is run to connect the vessel to the surface. The sample then is flooded with oil and a special brine to establish saturations somewhat as they exist in an underground oil reservoir. The "crude" used actually is a carefully refined stock. It was chosen because its properties would remain constant throughout the period of test, whereas a typical crude would lose its light ends.

Conventional bit. — Using a conventional rock bit a hole up to 6 in. in diameter then is drilled through the 6-ft. section. In this phase of work standard rates of rotation and penetration are employed. Different types of drilling muds are used to see which does the best job, using rates of circulation comparable to those in normal drilling practices.

After the hole is drilled through the formation a liner may be set and the face of the "pay" washed. In this phase of work different methods and solutions are used, as well as the effects of scraping and other drilling methods.

As soon as all tests are made on one type of completion method, the Cal Research men tear their "oil well" apart, recast a new sample formation, and start all over again on the study of another method.



Left: California Research Corp. "No. 1, La Habra Laboratory," where the well-completion studies are being carried on. Center: Looking down the 45-ft. shaft at the bottom of which is a pressure vessel for housing sample formations used in the experimental work. Right: Running casing into the hole preparatory to beginning completion studies. The draw works is simply a small air motor directly connected to a truck winch; the steering wheel serves as a brake. The rotary table is driven by an electric motor through a standard automobile transmission. In the background is the control panel.

Borneo Crude to California

LOS ANGELES.—A limited amount of crude oil from Borneo will be brought to California by Standard Oil Co. of California, because of the company's inability for the last several months to buy sufficient light crude in the state to take care of military and civilian requirements, T. S. Petersen, president, said.

The shipments still will leave Standard as a net exporter of crude from California, however, he said, inasmuch as approximately 14,000 bbl. daily are moved to British Columbia. He further stated that the West Coast oil industry, with only about 15 per cent of the total United States runs, has been supplying more than 50 per cent of the bulk military requirements for petroleum supplied by the country as a whole.

The U. S. oil industry east of the Pacific Coast has been importing about 500,000 bbl. daily of crude, as well as substantial quantities of products, assisting them to meet the military demands being made upon them, Petersen said. The Pacific Coast has not heretofore imported either crude or products except for a few isolated cargoes.

Purchase Offer Accepted

LOS ANGELES.—The offer of Tevis F. Morrow, Los Angeles independent oil operator, to purchase two-thirds or more of the 271,659 outstanding shares of stock of North American Consolidated Co. is being accepted by the shareholders.

Morrow offered to pay $80 a share for $10 par common stock if 181,106 shares, or 66⅔ per cent of the total issued, were deposited in escrow in a local bank before December 12. By last Friday a total of 186,285 shares already had been deposited, according to a Los Angeles brokerage firm acting as Morrow's agent. Under the terms of the deal he also will purchase any additional stocks tendered before 5 p.m. of that date.

North American's current daily production is approximately 5,500 bbl. Bulk of this output is from California fields although it has some oil production in Oklahoma, Texas, and Louisiana. *(The Oil and Gas Journal, November 30, 1950, page 44.)*

New Producing Depth Looms

LOS ANGELES.—The world's producing depth record probably will be 20 ft. deeper by the time this appears in print.

Current record holder is Standard Oil Co. of California 5 Mushrush in Wasco field of California, San Joaquin Valley district, completed in 1949 in an Eocene sand at a total depth of 15,530 ft.

The well threatening this record is Socal 2 Mushrush about ½ mile to the southeast of 5 Mushrush. Last week it topped the Eocene at about 15,350 ft. and was drilled to 15,550 ft. At last reports line was being run prior to completion.

The 2 Mushrush in April 1939 was completed for a potential of 6,100 bbl. daily in the Rio Bravo sand topped at 13,080 ft. In October, using company tools, deepening toward the pay zone of 5 Mushrush was started.

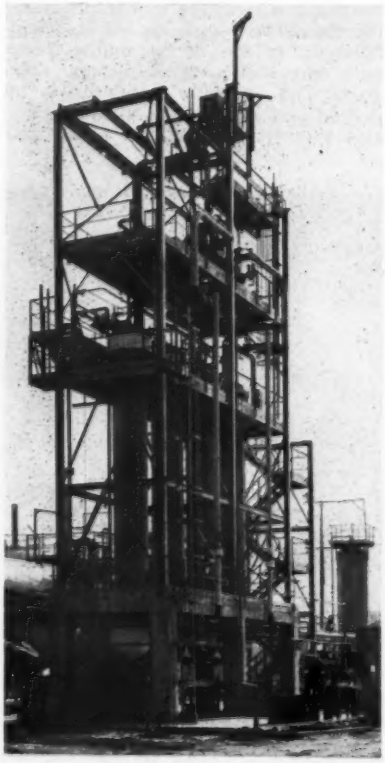
Unit Completed

Polymerization facilities operating at Torrance

LOS ANGELES.—To provide an additional source of high-octane gasoline, General Petroleum Corp. recently completed the addition of a catalytic polymerization unit at its large Torrance refinery here.

The new unit is producing about 700 bbl. of catalytic gasoline daily, using as feed stock the propane-propylene stream from the plant's vapor-recovery unit. Octane rating of the product is about 99 (research method) with the addition of 3 cc. of lead. The unit was designed and built by Lummus Co.

Cracked refinery vapors from the deethanizer, largely propane and propylene, are charged to the unit. Butanes and butylenes produced from Torrance cracking operations already were being charged to an existing alkylation unit so that the new unit operates solely on propylene.



Battery of reactor units for the new 700-bbl. catalytic polymerization unit recently completed at General Petroleum Corp.'s Torrance refinery.

Smog prevention. — A construction project under way at the 100,000-bbl. refinery is an ammonium sulfate plant of about 9 tons daily capacity. This work is a furtherance of the company's smog prevention program.

To remove all sulfur compounds from waste refinery gases, General Petroleum earlier this year added a diethanolamine absorber unit. Since ammonia gases have to be removed from the sour gases before the latter are run to the absorber, the new unit is being added to convert the ammonia vapors to ammonium sulfate.

SOUTHWEST

Gas Properties Purchased

DALLAS. — Lone Star Producing Co. has announced the purchase of producing properties, a pressure-maintenance plant and a gasoline-extraction plant, all in Stephens County, North Central Texas. Consideration was in excess of $2,000,000, according to E. F. Schmidt, vice president.

Production properties, including oil and gas wells and the pressure-maintenance plant formerly owned by Fred M. Manning, Inc., were purchased from the Malco interests. The gasoline - extraction plant was purchased from Cisco Hydrocarbon Corp. The latter plant operates on natural gas and casing-head gas produced from the Manning properties and other leases in Stephens County. Lone Star has a gas-purchase contract for the residue gas.

Oil and gas wells involved in the purchase will be operated as a part of Lone Star's West Central district, of which Francis Urban of Eastland is district production foreman.

Forty-nine Producers Sold

MIDLAND, Tex.—Forty-nine producing oil wells in the Sand Hills field of west-central Crane County, Texas, have been sold for more than $5,000,000 cash by A. A. (Jack) Bradford, Midland, to Samedan Oil Corp., Ardmore, Okla.

The wells are located on 1,560 acres of leases on the Tubb ranch. There are 3 producers in Section 5, 6 in Section 8, 26 in Section 17, and 14 in Section 20, all in Block 32, PSL Survey.

Several proven undrilled locations are on the leases, and it is reported that Samedan will drill all of these in the near future. McKnight lime is the producing horizon in 16 of the wells involved in the deal, and the Tubb sand is the producing zone for the other 33 wells.

ROCKY MOUNTAIN

Wildcat Ventures

Nevada's deepest test completed dry at 10,314 ft., but gives valuable geologic data; Idaho activity increasing

Polly DeArmond

ANOTHER important rank exploratory search for oil was completed recently when Continental Oil Co. and Standard Oil Co. of California finaled a joint venture in White Pine County, Nevada. Although the test was unsuccessful at a total depth of 10,314 ft. (the deepest well ever drilled in the state), it furnished valuable geological data which will be correlated in other tests.

The test is 1 Meridian unit (No. 1 on accompanying map). Started in May, it was one of the first wells in one of the immense untested sections of the country. Originally planned as a 7,500-ft. hole, it was spotted in SW Section 31-16n-56e, in an area where small quantities of paraffin-base oil had been reported.

A small oil and gas show was hit around 3,000 ft., and company officials said that while the show had no commercial significance, it did indicate presence of oil in the general vicinity. Operators were reported to be unitizing their Hayden Creek area, Township 15n-59e, in the same county, and building roads at another deep test of the structure.

The second wildcat, 1 Hayden Creek (No. 1) is approximately 20 miles east of the first well, and about 25 miles southwest of Ely.

Map showing location of wildcat ventures in Nevada and Idaho. Numbers refer to wells described in accompanying article.

Tight hole.—The 1 Meridian unit was important from a geological viewpoint, supplying information on formations down to the Devonian in the Pancake Range area of the Basin and Range Province. Although it was drilled as a tight hole, the following markers were released: base White Pine-top Joana limestone (Mississippian) 3,600 ft.; base Joana-top Pilot shale (Mississippian) 3,676 ft.; top Nevada limestone (Devonian) 3,970 ft. *(For leasing details see The Oil and Gas Journal, May 11, 1950, page 54.)*

Another currently active test in the state is McCarthy Oil Co. 1 Rahas (No. 2), 20 miles east of Elko near Halleck, Elko County, which is now down to 4,125 ft. in Pennsylvanian. It is scheduled to go to 9,000 ft. by rotary.

(For additional details on Nevada exploration, see the Rocky Mountain field report on page 150 of this issue.)

Idaho.—Four wildcats had been completed in Idaho at the end of November, and four other wells were either drilling or in the planning stage.

In the southwestern part of the state, Helmerich & Payne 1 State, C NW NW 16-6s-7e (No. 6), Indiana Cove area of Owyhee County, completed dry at 2,660 ft. The well topped basalt at 2,550 ft. The same operator's 1 Parker (No. 6), SE SE SW 19-6s-8e, failed at 3,808 ft., after finding basalt at 2,490 ft. The firm's 2 State (No. 6) SW SW SW 16-7s-9e, was dry at 2,068 ft., with basalt encountered at 1,970 ft.

In eastern Idaho, Sun Oil Co. and Sinclair Oil & Gas Co. finaled their 1 Unit at 5,597 ft. (No. 5). The well was located in Big Elk Mountain area, C NL NW SE 23-2s-44e, and had been planned as an 8,000-ft. test. The following formations were topped: Woodside 3,112 ft., Dinwoody 3,853 ft., Phosphoria 4,507 ft., Wells 4,878 ft.

Current operations.—Current operations in the south-central section include Cougar Oil Co. 1 Government (No. 4), NW NE SW 23-13s-26e, Malta area of Cassia County, scheduled to go to 2,500 ft.; Phillips Petroleum and Utah Southern Oil Co. 1 fee (No. 3), SW 10-14s-30e, Juniper anticline, Oneida County, deep test.

In the western part of the state, Idaho-Oregon Production Co. 1 Carco (No. 7), Section 34-9n-5w, Payette County, has stopped temporarily at 2,398 ft. in sandy shale. Four drill-stem tests were made. The first test at 1,317 ft. had water and a gas show; bottom-hole pressure was 410 psi. The second run at 1,516 ft. also made water and gas. The third test found water and gas at 1,585 ft.; bottom-hole pressure had increased to 700 psi. The last test at total depth, recovered a noncommercial volume of gas and oil with no water. The operator is waiting on heavier equipment to drill deeper in the wildcat.

Also in western Idaho, Swan Oil Corp. is rumored to be planning a cable-tool test on a block of 1,500 acres in Valley County.

GULF COAST

Tidelands Windup

Legal proceedings ended by U. S. Supreme Court

WASHINGTON. — The Supreme Court of the United States terminated the legal proceedings in the Texas and Louisiana tidelands cases this week, denying the states' petitions for a rehearing and approving, with but one change, the decree suggested by the Department of Justice.

The one change made by the court, however, was important to the states since it made them accountable to the federal Government only for revenues derived from tideland operations since June 5, 1950, the date of the original decision, instead of, as urged by the department, June 23, 1947, the date of the decision in the California case.

Lessees' liability.—While this will relieve the states of any danger of having to account for funds secured between the time of the California decision and last June 5, Interior attorneys pointed out the court did not deal with the question of liability of lessees of Texas and Louisiana and a decision whether to proceed against those lessees will have to be made by the Department of Justice.

As in the case of California, the court's decrees in the two cases held that the federal Government has paramount rights in the oil and gas deposits between the line of ordinary low tide and from the seaward boundaries of inland waters along the coasts of Louisiana and Texas to the outer edge of the Continental Shelf in the case of Texas and seaward 27 marine miles in the case of Louisiana. The decrees also enjoin the states and their lessees from taking any oil or

gas except under authorization first obtained from the United States.

Operations continue.—In an order issued immediately following the court's action, Interior Secretary Oscar L. Chapman authorized the continuation for a 60-day period of oil and gas operations now being conducted and advised producers conducting such operations that they may submit requests within 30 days for the negotiation of a further authorization.

Holders of state leases who are now conducting operations in the affected areas are required to pay to the United States, for the 60-day period, the rentals, royalties, and other payments provided for in the state leases, and state lease holders in such areas who are not now conducting operations may make similar payments.

"The relationship between the known domestic supplies of petroleum and the present and potential national needs, military and civilian, for petroleum is such that undue interruption of the present operations in the Gulf of Mexico would involve the risk of injury to our national security and economy," Chapman explained.

"Moreover, the producing wells and the elaborate facilities used in drilling for and producing oil and gas in the submerged coastal lands are subjected to unusual risks or loss, injury, and deterioration through action of the elements, which can only be avoided or minimized by continuous and vigilant operation and maintenance. Such loss, injury, and deterioration, if permitted to occur, would be an economic waste in an operation of benefit to the national security and economy and productive of income to the federal Government."

"Trespass" undetermined. — Chapman also pointed out that the extent of the relief to which the Government may be entitled because of "trespasses upon and unauthorized leases of submerged coastal lands" is still to be judicially determined, and pointed out the question as to whether any equities in lessees of a state may be recognized and, if so, to what extent, is dealt with in legislation pending in Congress.

Interior attorneys said that since the Department of Justice already has renounced any claim to areas between the mainland and the islands which run along the coast of Texas no difficulty is anticipated with respect to the delineation of the area to which the Government is entitled, but that the complicated coastline of Louisiana presents a problem and, failing the negotiations of a stipulation covering operations while doubtful boundaries are settled, as in the case of California, the Government will seek the appointment of a receiver, who will supervise operations in the doubtful areas until their boundaries are fixed.

Petroleum-Coke Study

Tests prove that product can be substituted for coke made from coal for firing spreader-stoker type boilers

George Weber

PETROLEUM coke for firing spreader-stoker type boiler units makes a satisfactory substitute for industrial coke manufactured from coal. This conclusion, qualified by several "ifs," has been reached by engineers of Combustion Engineering-Superheater, Inc., New York, following studies conducted on a steam-generator unit in the Chicago area.

The principal qualification is economic, and the economics of petroleum coke defy generalization. Each particular case where such fuel is considered for this new use, whether by a fuel purchaser or by a refiner using his own coke for plant steam generation, must be judged on local factors of quality, price, and supply. In general it can be said, however, that while petroleum coke exceeds industrial coke in heating value, the extra requirements of equipment modification, operator supervision, and the possibility of added corrosion problems offset the B.t.u. advantage to place the petroleum product roughly on a price par with coal coke.

Test results.—Results of Combustion Engineering's tests bear out these tentative generalizations. The tests were undertaken at the request of a California refining company which was looking into the possibility of using such coke as a fuel for stills and boilers. A steam-generating unit equipped with a spreader stoker was selected in the Chicago area for the studies.

The unit is rated at 25,000 lb. per hour at 275 psi., and 440° F. Total grate surface measured 10 by 10 ft. The only modification consisted of blocking one-third of that area with a sloping refractory wall to simulate the furnace contour of an oil heater.

Tests were begun in August 1949 and continued up to the end of April 1950. No 'round-the-clock firing was conducted as the unit selected operated only for daytime steam generation. Practically all tests were conducted with fuel on the "run-of-the-pile" basis, with the exception that lump sizes exceeding 2 in. were removed. Tests were run at approximate burning rates of 15, 25, and 30 lb. per square foot of grate surface.

Feeding system.—The spreader stoker employs a controlled feeding system which throws the solid fuel horizontally toward one end of the furnace area. Distribution is accomplished by the varying distances which different particle sizes are projected into the furnace. Further distribution is afforded by a moving bed. This continuous-discharge type of spreader is recommended to maintain a bed of ashes for protection of grates. Since petroleum coke contains so little ash, the moving bed should be slowed to a rate of 4 to 6 in. per hour. This procedure will permit the formation of a fairly level bed throughout the firing area, and will allow the build-up of a sufficient thickness of ash to protect grates from high-temperature damage.

Two grades of petroleum coke were burned in the test boiler, both produced in delayed-coke type process units. A limited shipment of California coke, termed "Santa Maria," was first fired in the unit. Following this initial test, the operation was continued for several months using a locally produced product termed "Producers" coke. Analyses of the two fuels are shown below:

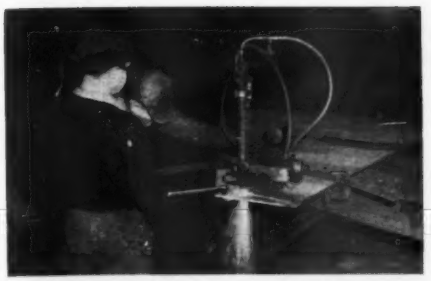
PROXIMATE ANALYSIS
(Weight per cent)

	Santa Maria	Producers
Moisture	4.06	3.38
Ash	0.84	0.64
Volatile matter	12.04	11.77
Fixed carbon	83.06	84.21
Heating value, B.t.u./lb.	14,413	15,040
Ash fusion temp., °F.	2,470	2,140

ULTIMATE ANALYSIS
(weight per cent)

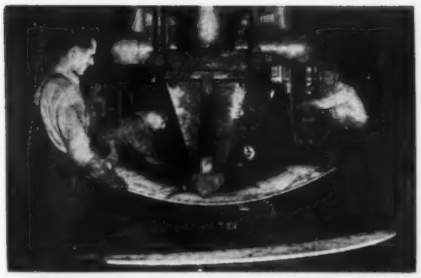
Moisture	4.06	3.28
Carbon	83.74	87.57
Hydrogen	4.00	4.27
Nitrogen	2.36	2.38
Oxygen	1.53	0.86
Sulfur	3.47	1.00
Ash	0.84	0.64

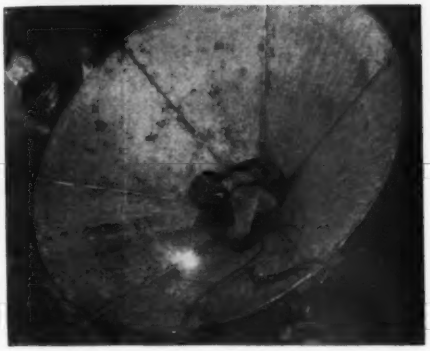
High sulfur content. — The Santa Maria type of coke revealed its California origin in the high sulfur content. Analyses of ash content of vanadium oxide were not made, but the percentage is believed to be high in the California product. The presence of vanadium oxide, particularly in West Coast and Venezuelan crudes, presents two possibilities of interest to possible users of petroleum coke for boiler firing. Vanadium pentoxide is generally believed directly or indirectly to cause serious corrosion to metal surfaces at temperatures exceeding 1,000° F., its fusion point. The limited tests on Santa Maria coke did not allow an intensive study of this effect. Damage to grates was incurred, but how much was due to high temperature due to low ash protection, and how much to outright vanadium attack, was not determined. Initial firing with bare-grate surfaces brought grate temperatures to about 1,200° F., but continued operation would reduce this temperature to below the



Left: This view shows a plate for the cone top of a reactor being flame-cut to the required size and shape.

Right: After cutting, the conical top plate is shaped to the proper curvature in the press as shown.

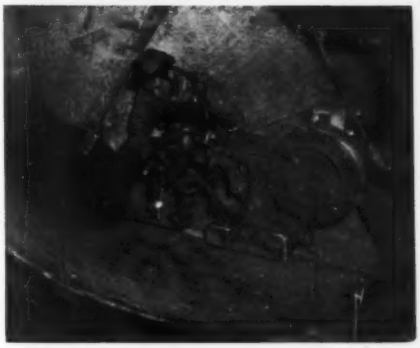




Left: This view shows a welder tack-welding the top plates to form the conical head.

Right: Assembly of conical top was completed by automatic welding with Union-melt equipment.

The cone top on each of the three vessels for the Scottish Oils Ltd. refinery is made of ASTM - A-240, Grade M, Type 316 stainless steel.

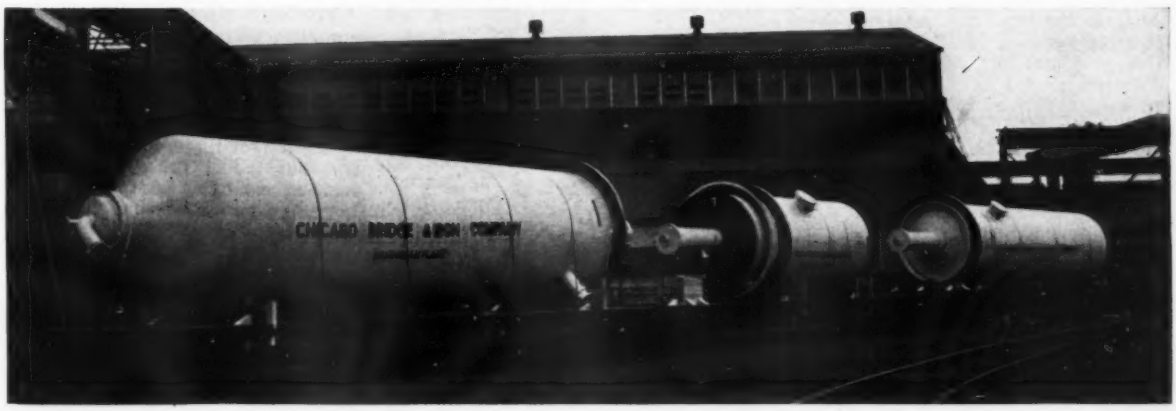


Stainless Steel Towers for Scottish Refinery

Two of the vessels shown below are phosphoric acid reactors, 9¼-ft. in diam. by 55-ft. 5 in. high. The third is an 8½-ft. diam. by 22-ft. catchpot. We built them for the Scottish Oils Limited refinery at Grangemouth, Scotland.

The shell, cone top and bottom of each vessel is made of A.S.T.M. - A-240, Grade M, Type 316, stainless steel. The legs extending from the bottoms of the vessels are also made of this alloy. The legs on the reactors are lined with Hastelloy while the one on the catchpot is lined with nickel.

These towers are a testimonial of our ability to handle corrosion-resistant alloys. In addition to special structures like these, we also build flat-bottom storage tanks, pressure storage tanks and tanks equipped with floating roofs. Write our nearest office for estimates or quotations.



CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg.
Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025—201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 National Standard Bldg.
Los Angeles, 17.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3...1615—1700 Walnut Street Bldg.
Salt Lake City, 4.....525 West 17th South St.
San Francisco, 4.....1554—200 Bush St.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela
Comprimo N.V., Amsterdam—O, Netherlands
Compagnia Tecnica Industrie Petroli, Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Sociedade Chibridge de Construcoes Ltda., Rio de Janeiro, Brazil

1,000° F. point as shown by one run extended to 20 hours.

Metal recovery.—Offsetting the corrosion problem presented by burning vanadium-bearing coke is the possibility of recovering commercial quantities of that valuable metal from the ash. It is known that during the war, the cleaning of slag from fireside tubes in marine boilers became a profitable operation because of the vanadium recovered.

While petroleum coke gave satisfactory performance in the single unit tested by Combustion Engineering, its use for firing process units cannot at this time be recommended. This is true mainly because of the lack of proper control and the need for constant operator attention. The experience gained in the Chicago runs provides a sound beginning to the study of this possible new outlet for what amounts to a petroleum by-product. Detailed information on the tests is available from Otto de Lorenzi of Combustion Engineering-Superheater, Inc., New York, who supervised the study. An extensive color motion picture record of the operation gave valuable information on fuel distribution, flame length, and other pertinent factors affecting the successful firing of petroleum coke.

CANADA

Alberta Crude Being Stored

First Alberta crude oil to be moved east by pipe line has begun flowing into tankage at Superior, Wis.

This marks the beginning of full operation of the newly completed 1,127-mile Interprovincial Pipe Line Co. system extending from Edmonton, Alta., to the head of the Great Lakes at Superior.

Approximately 1,800,000 bbl. was required to fill the line. Oil began arriving at Superior December 4. The first section of the line from Edmonton to Regina, Sask., was opened with the official valve-turning ceremony October 4. Final weld on the entire system was made November 2 at Blackberry, Minn.

The $90,000,000 system consists of 20-in. to Regina, 16-in. to Gretna, Man., and 18-in. to Superior. Principal interest holder in the Interprovincial company is Imperial Oil, Ltd., (Standard Oil Co. [N.J.]). Completion of the line in slightly more than 6 months made it one of the fastest major pipe-line construction jobs in the history of the industry.

The line will move some 95,000 bbl. daily out of Edmonton when full capacity is reached next spring following the completion of all pumping facilities. Capacity of the line from Regina to Superior is 70,000 bbl. daily. Crude will be stored at Superior during the winter months and moved eastward by lake tanker during the summer to refineries in Ontario.

MEETINGS

Engineer Shortage Cited

SANTA FE.—It now appears that the annual supply of engineering trainees will fall short of industrial requirements until at least 1957, due to a drop in enrollment brought about by mobilization, Clarence B. Folsom, Jr., head of the petroleum engineering department of the New Mexico School of Mines, Socorro, told members of the New Mexico Oil and Gas Association here last week.

Folsom said that the present situation indicates that universities will be able to supply only one-third of the industry's requirements for the next 4 years. A survey made earlier in the year indicated there would be a shortage of engineering graduates until about 1954, he said.

"About the only solution that I can see is for us to interest more high-school graduates in taking up careers in the petroleum industry," he said. "I hope that your organization will assist us in this respect by encouraging young men of your acquaintance to enroll with the New Mexico School of Mines. You must help us sell them on the advantages of a career in the oil industry, and in return, we will undertake to provide you with capable, well-trained recruits for your operations."

Folsom said that Russia will start a war when "and only when she believes that the oil fields of the Middle East can be overrun and captured intact." He said that without this oil she cannot fight a major war, and that this fact has been known by the petroleum industry for many years.

Tractor Use of L.P.G. Up

AMARILLO. — Reliable estimates show that approximately 75,000 tractors will be converted to operate on L.P.G. fuel this year, A. J. Turner, General Tank & Steel Corp., Roswell, N. M., told a group attending the Natural Gasoline Association meeting here last week. Although L.P.G. has been used to fuel irrigation pumping engines for the past 10 years, its use for farm tractors, trucks, buses, and other mobile equipment began its big boom just about 2 years ago.

This widespread interest has resulted in reducing from 30 to 60 per cent the cost of converting farm tractors to L.P.G. fuel. Further reductions are certain to come with better standardization of equipment and larger volume of conversions. Today's carburetion systems range in costs from $30 to $250, he said.

"If a sensible long range viewpoint is taken by the industry there will not be short periods of temporarily inflated L.P.G. prices that are considerably out of line with the long-range trend," Taylor said. "The distress prices of the past 18 months are not necessary in order for the industry to develop a substantial direct motor-fuel market for propane and butane. However, this price situation has undoubtedly given a substantial impetus to the conversion of engines. When a considerable investment is required on the part of the consumer a temporarily high differential in price under gasoline substantially aids the conversion program by providing a satisfactory pay out on the investment," continued Taylor.

"Experience shows that very few farm tractors can be converted from gasoline to L.P.G. if the retail price differential is 3 cents per gallon or less. A price differential of 4 cents will allow a substantial market with sufficent sales effort, but a differential of 5 cents or more is required if this market is ever to reach the 60 to 70 per cent saturation predicted for some areas," Taylor said.

Adequate Reserves Needed

WICHITA.—The basic objective of the United States is acquiring petroleum reserves adequate to meet all peacetime and emergency needs, and to attain such an objective, the oil industry must discover and make available not only normal needs, but enough in excess to meet any emergency. This was stated by H. B. Fell, executive vice president of the Independent Petroleum Association of America, before the Kansas Independent Oil and Gas Association here last week.

Fell said the oil industry can accomplish this only if it has the capital, manpower, and freedom from unnecessary government controls.

"We in the oil industry," he said, "are willing to sacrifice whatever is necessary for the defense of our country, but I feel there should be no rush to establish controls. Past history has indicated that a free, dynamic oil-producing industry can accomplish far better results than a government-controlled oil industry."

Fell cited the oil industry's loss of efficiency under government regulations during World War II when productive capacity dropped off 177,000 bbl. daily in the 4-year period from 1941-45.

Among reasons for this unsound trend, he said, was the freezing of crude-oil prices at unrealistic levels, inadequate materials and manpower, and the creeping paralysis that comes with centralized controls.

Fell pointed out that comparatively the oil industry has carried out a great expansion in exploration, development, and producing activities in the 5 years since wartime restrictions were lifted.

LATIN AMERICA

Peruvian Oil Law

Action on proposed law which would open up country to renewed exploration put off until early next spring

Dahl M. Duff

ACTION on the proposed new Peruvian petroleum law which would open up the country to renewed exploration has now been put off until early next spring, according to reports from Lima.

Industry sources originally felt there was a possibility of approval of the law in the extra session of the Peruvian Congress which convened December 8. Latest reports are that this session will largely confine its attention to budgetary matters and adjourn December 20.

It now appears that the administration of President Manuel Odria will press for action on the proposed oil law in March after the congress again convenes. The new law was drafted about a year ago by a special government commission and presumably carries the full support of the administration.

Meanwhile, three companies are continuing preliminary exploratory work in the Sechura Desert area under special nonexclusive government permits. Whether this work will continue and develop into full-fledged exploratory programs depends on passage of the new law in the not-too-distant future.

Further delay.—The further delay in action by Peru to provide a workable legal foundation for oil operations adds still another page to the record of efforts in this direction over the last 5 years. In 1946, A. A. Curtice, now president of Conorado Petroleum Corp., assisted with the drafting of a satisfactory law, but it mired down in politics.

The present Peruvian Congress first convened July 28 after elections in which General Odria, formerly military head of the government, was chosen president. The administration's petroleum law was submitted to Congress August 7 by the minister of development, Jose del Cabrejo, but hopes for its early passage at that time were not realized.

Opposition.—The opposition to acceptable oil-exploration legislation in Peru is said to arise from several ill-related sources. Among them are the usual socialistic and nationalistic elements. Also included are certain wealthy landowning groups who are fearful of the possible disruption of the existing economic and labor pattern that might follow large-scale petroleum development.

The effect of the lack of a satisfactory law is to confine present foreign-capital operations to existing areas, principally those of International Petroleum Co., Ltd., and the British-controlled Cia. Petrolera Lobitos in the northern coastal region. The country's production of about 40,000 bbl. daily is being maintained only by a fairly intensive drilling program, and how long it can be held in the absence of exploration elsewhere is in question.

The special government commission which drafted the new law included Artidoro Alvadado Garrido, head of the government's Petroleum Division. President Odria himself is on record with several statements favoring steps to allow foreign companies to develop whatever additional reserves Peru may have.

Three regions.—As proposed, the law divides Peru into three separate regions and fixes different royalties, surface taxes, and concession periods in each. The three regions are the coastal zone, the mountain area, and the trans-Andean montana. The lowest and easiest terms are for the montana. Royalty ranges from 12½ per cent in the coast to 3 per cent in the montana.

Half of the exploration acreage can be retained when converting to an exploration concession. The half kept by the government, plus areas from the concessions abandoned, renounced, or canceled, become free areas that can be regranted as formerly. Any part of these areas can be designated a national reserve by executive decree. Sealed bids are required to obtain exploitation concessions on the national reserves. All of the offshore continental shelf is a national reserve.

Surface tax.—The surface tax, in exploration, per hectare per year, is 2 soles on the coast, one sole in the mountains, and 1/5 sole in the montana (one sole is worth about 6 cents). In the exploitation period, the per hectare fee ranges from 5 soles per year the first 10 years to 25 soles after the twenty-fifth year. On converting, an initial payment of 25 soles per hectare is required on the coast. These fees in the mountains and montana, respectively, are one-half and one-quarter of that for the coastal zone.

One objectionable feature now existing in Peru which would be removed as a result of the new law is the 33⅓ per cent export tax levied on crude exported. In general, the law provides that petroleum will bear only the same taxes as on other enterprises in the country.

International, Richmond Petroleum Co., and Conorado are the three companies now carrying on preliminary geological and geophysical work in separate programs in the Sechura Desert in the coastal area. The permits under which they are working were promulgated by decree about 15 months ago.

New Oil Law Approved

The Bolivian Chamber of Deputies has just approved a new law permitting the free exploitation of Bolivian oil resources. National and foreign private operation is to be allowed without restrictions.

The new legislation is particularly attractive to private capital. Under the recently approved law, it will be possible for private capital to develop the oil properties in the departments (states) of La Paz, Beni, Pando, and Cochabamba.

In the event that the senate should approve the above-mentioned law already passed by the house, foreign or national capital may be invested in oil activities, without any restrictions, in the aforementioned departments.

Mexican Output Estimated

Mexico's oil production this year will be at least 72,000,000 bbl., it was predicted last week by Sen. Antonio J. Bermudez, director general of Petroleos Mexicanos.

Bermudez' estimate, released through Pemex's Washington information office, was based on the production of 53,333,722 bbl. during the first 9 months of the year, a 21.5 per cent gain over the 43,879,846 bbl. produced in the corresponding 1949 period.

"This year's output will greatly exceed that of every other year in a half century of commercial production except for the relatively short bonanza period covering the 8 years from 1919 through 1926," Bermudez said.

Natural-gas production for the first 9 months of 1950 amounted to 8,863,496 bbl. measured on the basis of 5,000 cu. ft. of gas as the calorific equivalent of 1 bbl. of petroleum, an increase of nearly 28 per cent over last year.

Refinery runs totaled 44,292,997

XUM

bbl. compared with 43,126,846 bbl. in 1949, and 53 wells drilled in the third quarter brought the 9-month total to 135, a 20 per cent increase; drilled footage increased 11 per cent to 528,832 ft.

Bermudez released figures on third-quarter operations, as compared with the same period last year, as follows:

	Third quarter 1949 (bbl.)	Third quarter 1950 (bbl.)
PRODUCTION		
Crude oil	15,662,377	18,718,832
Distillate	12,404	6,950
Gas (5,000 cu. ft. as calorific equivalent of 1 bbl. of petroleum)	2,487,345	3,526,733
Total	18,162,126	22,252,515
Refinery runs, total	15,136,942	13,602,614
WELLS DRILLED	—Number—	
Exploration	8	1
Development	36	52
Total	44	53
FOOTAGE DRILLED	—Feet—	
Exploration wells	41,434	6,907
Development wells	153,612	175,252
Total	195,046	182,159

MIDDLE EAST

Sidon Crude Price

Competition has brought it down to common level

COMPETITION among the three suppliers last week brought the export price of crude at the Sidon, Lebanon, terminal of the new trans-Arabian pipe line down to a common level.

The three companies sharing in the line's throughput had used the same principle of Persian Gulf price plus tanker differential to arrive at the Sidon price, but each of them had figured the tanker rate by slightly different methods.

As a result, the originally fixed prices at Sidon were $2.41 a barrel for Socony-Vacuum Oil Co., Inc.; $2.45 for California-Texas Oil Co., Ltd.; and $2.55 for Standard Oil Co. (N.J.). Last week it was disclosed that Jersey Standard and Caltex had cut their quotations to the lower $2.41 Socony-Vacuum figure.

Reports from Washington were that officials of the Economic Cooperation Administration were still studying the matter of the Sidon price to determine if crude exported at that figure will be eligible for ECA financing. Much of the crude exported, even to European subsidiaries of the supplying companies, needs ECA financing.

Price basis.—The $2.41 price first set by Socony-Vacuum is the Persian Gulf price of $1.75 plus the tanker differential of 66 cents based on 2-year time charters. Caltex's original 70-cent differential was the flat U. S. Maritime Commission difference. Jersey's first price of $2.55 was based on the tanker differential combining time and single-voyage rates, according to reports in the industry.

The trans-Arabian system opened on December 2 with the loading of the first tankers. Caltex's reduction to $2.41 was retroactive to that date. The lower price for the Jersey company also applied to its price for crude lifted from the Tripoli terminal of the Iraq Petroleum Co., Ltd.'s Kirkuk pipe lines. Socony-Vacuum's $2.41 price covered both Sidon and Tripoli exports.

There was no indication last week that any of the other sellers of crude in the Persian Gulf will follow the step taken by Socony-Vacuum in making an official posting of its crude prices in that area *(The Oil and Gas Journal, December 7, 1950, page 67)*.

Kuwait Shows More Profit

Kuwait Oil Co., Ltd., showed a profit of £3,980,000 for 1949 against £2,348,000 and £560,000 respectively during the 2 preceding years, according to the company accounts revealed in London. These figures apply to gross profit before amortization charges based on heavy capital expenditures of the company.

Anglo-Iranian Oil Co., Ltd., and Gulf Oil Corp. each hold half of the £200,000 capital of the Kuwait company. The 1949 profit shown is equivalent to about $11,000,000 at the official rate of exchange.

None of the profit is being paid in dividend to the parent companies, nearly all going to depreciation. Last year's profit was from an output of 12,000,000 tons of crude oil (about 247,000 bbl. daily). Production this year is expected to be about 335,000 bbl. daily. First commercial production in Kuwait was in 1947.

The Kuwait concession cost £251,000. More than £33,000,000 has been advanced in interest-free loans by Anglo-Iranian and Gulf to develop Burghan field. With most of the construction and development program now completed, these loans will presumably be converted into more permanent capital.

Information on the company's earnings was made available from public records required by the British Government to be filed in London.

EUROPE

Refinery Project

Initial work starts on new Kent, England, plant

INITIAL site work has been started by Anglo-Iranian Oil Co., Ltd., on its new refinery in Kent, England, which will have a capacity of 40,000 bbl. daily.

The project received final British Government approval last June, and includes construction of a complete new refinery on a promontory at the confluence of the Thames and Medway estuaries opposite Sheerness. The flat, marshy area, now grazing land, is protected from high water by a sea wall.

The so-called Isle of Grain refinery project has been under consideration for more than 3 years. As originally announced Gulf Oil Corp. was a half-interest partner, but subsequently Anglo-Iranian assumed the entire project.

When the new plant goes on stream it will give Anglo-Iranian its fourth

Refinery-Construction Program

What is shown here is indicative of the refinery construction program which has been taking place since the end of the war throughout western Europe and particularly in Britain. The scene is at Bothwell in England during the transportation of a fractionating column by truck to the enlarged refinery of Shell Refining & Marketing Co., Ltd., at Stanlow, Cheshire. The first new unit at Stanlow went in operation last November. The expansion program of the British refining industry is now at about its midway point; by 1953 Britain expects to have a total capacity close to 20,000,000 tons a year, or about 400,000 bbl. daily, operating almost wholly on Middle East crude oil.

refinery in the United Kingdom and the first completely new one built in the company's postwar refinery-construction program. Charge stock will be Iranian or Kuwait crude or a mixture. The program calls for bringing the units into operation as follows:

Early 1952: Crude distillation with sweetening for basic line of products.

End of 1952: Lubricating-oil manufacture.

Early 1953: Catalytic cracking unit and further treating facilities for improvement of products.

To bring the plant into initial operation, the crude-distillation gasoline stabilizers, and a copper chloride sweetening plant will be erected. The second stage of construction provides for vacuum distillation, propane-deasphalting, furfural extraction, dewaxing, clay contact treating, along with tankage for the manufacture and blending of lubricating oils.

Sea water.—Sea water will be used for cooling, with approximately 4,000,000 gal. per hour required. Steam will be furnished by a battery of 150,000 lb. per hour boilers driving back-pressure turbo-generators at about 650 psi. Exhaust at 175 psi. will supply process steam.

Of Anglo-Iranian's other three U.K. refineries, the two principal installations are at Grangemouth in Scotland and at Llandarcy in South Wales. The third plant, at Pumpherston, near Edinburgh, processes Scottish shale-oil production plus the small indigenous English crude production. Pumpherston has a capacity of about 3,600 bbl. daily. It and Grangemouth are operated by Scottish Oils, Ltd., and Llandarcy is operated by National Oil Refineries, Ltd.

Other expansion.—Both the Grangemouth and Llandarcy refineries are well advanced on major expansion programs. Grangemouth is being enlarged to handle about 30,000 bbl. daily, and a new 60-mile 12-in. pipe line is being laid across Scotland to supply crude. The first stage of construction, including mainly distillation and treating, is scheduled for completion by the end of the year. Later plans call for catalytic cracking and polymerization.

Llandarcy has already reached its scheduled capacity of about 46,000 bbl. daily, but work is continuing on the remainder of the program which includes catalytic cracking, an asphalt plant, SO_2 solvent extraction, and 1,000 bbl. daily of additional lubricating-oil capacity. Both Llandarcy and Grangemouth had prewar capacities of about 7,200 bbl. daily.

Europeans Visit U. S.

A group of 14 prominent Western European chemical research scientists last week visited the Esso Research Center of Standard Oil Development Co. and Esso Standard Oil Co.'s Bayway refinery at Linden, N. J., as a part of a tour of American industrial centers under the sponsorship of the Economic Cooperation Administration. The visitors were from Austria, France, Germany, Italy, the Netherlands, Norway, Sweden, and Denmark.

British Aid

ECA may cut allotment due to U. K. recovery

WASHINGTON. — Curtailment and possible suspension of Marshall-plan aid to Britain is under consideration in Washington and London as a result of the marked recovery the United Kingdom has made in the past 2 years.

The situation will be reviewed upon the arrival in London of William L. Batt, new Economic Cooperation Administration mission chief to the United Kingdom. Aim of the discussions will be to cut the dollar drain on ECA while keeping Britain in the European Economic Cooperation organization and the European Payments Union.

The matter has been under informal discussion for some months, and British officials are represented as agreeing that the time has arrived for a new evaluation of the need for Marshall-plan aid.

Weighing the factors in the situation, ECA officials pointed out that in the past year Britain's gold and dollar reserves doubled; exports in the third quarter of this year were at a postwar high and the trade deficit was only one-third of that for the corresponding 1949 period; and industrial production showed a less than seasonal decline during the summer months and remained close to 50 per cent above prewar. On the other hand, rearmament will reduce exports to those areas that primarily supply raw and strategic materials for Britain's industry and, with other factors, slow down the growth of gold reserves.

Accordingly, officials said, any suspension of ECA may be temporary and any new economic relationship between ECA and Britain will be one of standby rather than one of termination.

Allotments.—Between April 3, 1948, and October 19 of this year, ECA allotments to the United Kingdom totaled $2,705,000,000 out of a total of $10,357,700,000 committed, or roughly about 25 per cent of all Marshall-plan aid.

ECA allocations for petroleum procurement by all participating countries topped the billion-dollar mark in September, totaling $1,005,300,000 at the close of that month. More than half of this was taken by France and Britain, the former getting $302,100,000 and the latter $295,300,000.

INTERNATIONAL NUMBER

The Journal's annual International Number, which will appear December 21, will feature petroleum developments throughout the world. Also included will be a comprehensive article on Russian oil production; a survey of all the oil fields, refineries, and pipe lines serving the industry exclusive of the United States; and an engineering section on modern practices in foreign operations.

Other countries. — Other countries sharing in the petroleum authorizations were Italy, $90,400,000; the Netherlands, $55,500,000; Belgium-Luxembourg, $53,900,000; Sweden, $50,200,000; Denmark, $43,400,000; western Germany, $31,200,000; Norway, $27,200,000; Greece, $21,700,000; Ireland, $12,500,000; Portugal, $8,100,000; Trieste, $7,000,000; Austria, $3,000,000; Turkey, $2,600,000; and Iceland, $1,100,000.

A breakdown of the total shows that authorizations for procurement in the United States totaled $287,300,000; Canada, $100,000; Latin America, $110,500,000; participating countries, $254,200,000, and nonparticipating countries, $353,200,000 of which $352,339,000 was for Saudi Arabia, Iran, Iraq, Bahrein, Kuwait, and Israel.

In addition to the European countries, oil has been provided for Korea to the extent of $8,947,000, of which $4,953,000 was from the United States and the remainder from the Middle East, and for China prior to its fall to the communists in the sum of $26,533,000, of which only $1,787,000 was from the United States, $452,000 from the East and West Indies, $78,000 from British territories in Asia, and $24,217,000 from the Middle East.

Greece Limits Oil Use

The Greek Government has drastically limited consumption of petroleum products because of the heavy drain made by petroleum on the country's foreign-exchange resources.

Private motor cars and taxis can be used only 3 days a week under the new government decree. The minister of national economy, Evangelos Averoff, also has restricted the use of gas oil for central heating.

The minister said civilians in Greece were currently using more than 170,000 tons of motor fuel compared with 65,000 tons before the war. The military and civilian aviation are taking another 55,000 tons. He said Greece is now spending more than a third of its foreign exchange for petroleum and that the country's economy could not stand it.

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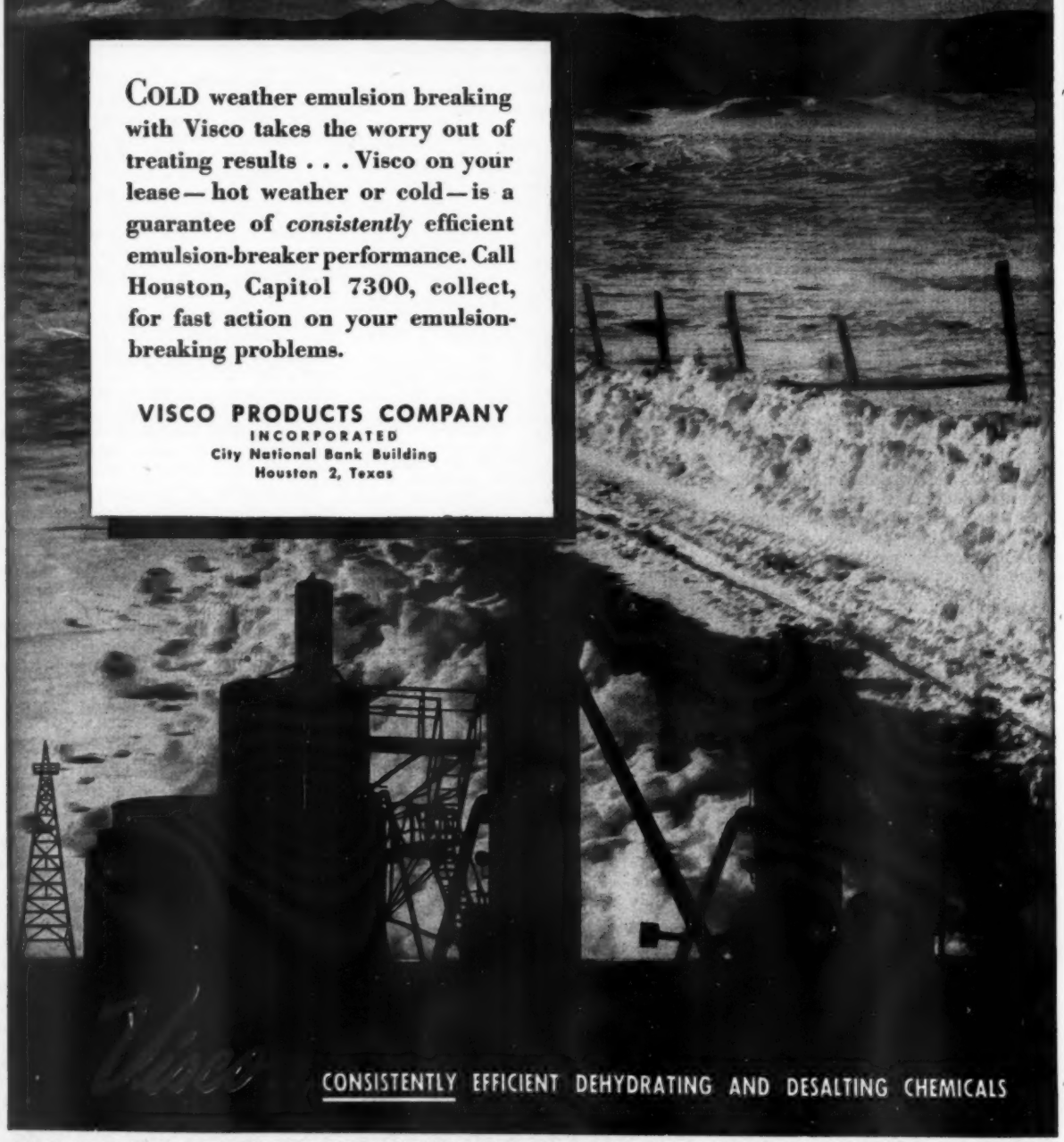

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PERSONALS

Superintendent

Copeland has been with The Texas Co. since 1926

W. G. COPELAND, superintendent of The Texas Co.'s Eagle Point Works, Westville, N. J., is a veteran refiner, having been with the company since 1926.

A native of Shawnee, Okla., Copeland joined Texaco in 1926 as a helper in the laboratory at the firm's Port Arthur, Tex., refinery. After his graduation from Rice Institute, Houston, in 1927 as a chemical engineer, he became a full-time employe as a chemist at the refinery. He advanced through various posts in the refining department, and was transferred to New York in 1934.

In 1939, he was assigned to the refinery of an affiliated company in France, and later became assistant superintendent at Texaco's San Antonio refinery. He was appointed superintendent of the firm's refinery at Sunburst, Mont., in 1943, and in May 1950, was appointed superintenden en of Eagle Point Works.

Paul E. Kuhl, until recently assistant general manager of Esso Standard Oil Co.'s East Coast manufacturing, has begun a 1-year assignment as assistant general manager of the company's over-all manufacturing operations. The newly created position will be filled on a rotational basis as part of Esso's management-development program.

Robert P. Bannon, presently engaged on a Shell Oil Co. fellowship at University of Michigan, was named winner of the A. MacLaren White Award for his undergraduate work at University of Illinois on the purification of tallow by propane extraction. Runnerup in the contest was **Leonard R. Brooks,** recent University of Oklahoma graduate, now employed by Tennessee Gas Transmission Co. at Natchitoches, La.

Norman Fawley has been named head of the oil-conservation division at Esso Standard Oil Co.'s Baltimore refinery. At the same plant, **David Lewis** has been named technical assistant in the process department in charge of catalytic cracking and light-ends operations. **William Sheridan** has been appointed technical assistant to the process superintendent on a training basis.

R. W. McCanne, assistant to the manager of production for Ohio Oil Co., Findlay, has been named assistant manager of the Casper, Wyo., division. **E. B. Stewart,** Tulsa division superintendent, has been named manager of the newly established Sidney, Neb., division; and **R. C. Farley,** assistant to the general superintendent of production at Findlay, has been named Tulsa division superintendent succeeding Stewart. McCanne first joined Ohio Oil in the Red Desert area of Wyoming in 1928 while still a geological student at Colorado University. He was appointed Casper division geologist in 1945, and was transferred to Findlay as assistant to the manager of production in 1950. Stewart joined the company in 1919 as a roustabout at Ranger, Tex., and was appointed Tulsa division superintendent in 1948. Farley joined the firm in 1926, and was named assistant superintendent of production in 1949.

E. W. Bergquist, safety engineer for Interstate Oil Pipe Line Co. at Tulsa, has been named vice chairman for pipe lines of the petroleum section of the National Safety Council, succeeding **Don M. Refcot** of Service (formerly Stanolind) Pipe Line Co., Tulsa.

VISITORS.—W. T. Irvine, left, and R. E. Johnson, right, of Anglo-Iranian Oil Co., Ltd., are shown in New York City with D. T. O'Connor, export representative. Irvine and Johnson have been in this country gathering information on modern drilling methods.

J. F. O'Malley, formerly head of the mechanical-planning group at Esso Standard Oil Co.'s Bayway refinery, has been assigned the job of developing application of a storehouse symbolization and control program. **W. H. Rowland, Jr.,** succeeds O'Malley, and **W. M. Kerns** replaces Rowland as cost analyst for the refinery, assisted by **J. E. Connor,** formerly supervisor of experimental work at the refinery laboratory.

Warren L. Ambrose, Fort Worth field representative of the crude-oil supply and transportation division of Cities Service Oil Co. (Del.), has been transferred to Midland, Tex., replacing **Bob Roehl,** who is being moved to the headquarters office at Bartlesville, Okla.

Eugene Cortinas, formerly consulting geologist with **Dr. J. Huner, Jr.,** at Baton Rouge, La., has joined the geological staff of Crown Petroleum Co. at Houston.

David Murphy, treasurer for Saltmount Oil Co., of Denver, has been appointed president of the firm, and of Mountain Producers, an affiliated company, succeeding **Harold D. Herndon** who has resigned to become a consultant in investments and royalties in San Antonio. Murphy will continue to make headquarters in Denver.

Allan Cree, assistant division geologist with Cities Service Oil Co. at Casper, Wyo., has been transferred to the newly established offices for the Montana area at Billings. **P. M. Model** will be scout for the area.

W. F. Bower, petroleum geologist, has sold his interest in Rine Drilling Co. at Wichita, and will become an independent consultant. He was formerly with Sunray Oil Corp. before acquiring an interest in Rine in 1946.

George Wesley, geologist for Skelly Oil Co., Tulsa, is on special assignment in Gallatin County, Illinois.

P. M. Barry, production engineer in the San Joaquin division, Bakersfield, Calif., for General Petroleum Corp., has been named resident engineer in the southern production division at Los Angeles, replacing **Claude W. Pierce,** who has been named superintendent of water disposal. **William Alexander, Jr.,** engineer in the San Joaquin division, has been named assistant resident engineer.

Dr. G. G. Oberfell, retired vice president of Phillips Petroleum Co., where he organized and headed the company's research department, has been

XUM

PERSONALS

appointed consultant to Reconstruction Finance Corp. on matters pertaining to the Government's synthetic-rubber program.

W. G. Skelly, Tulsa oil man, has been elected chairman of the state Santa Claus commission, succeeding the late Frank Phillips, Bartlesville, Okla. Other members are **F. E. Harper, Gov. Roy J. Turner's** partner in Turner-Harper Oil Co., and **L. B. Simmons,** Duncan, Okla., oil man. The commission annually supplies gifts to children in orphanages and state institutions.

M. P. Love, manager of Shell Oil Co.'s manufacturing research department in New York, has been named manager of the firm's Houston refinery succeeding **P. E. Foster,** who is retiring after 35 years with the company.

Dr. Gustav Egloff, of Universal Oil Products Co., has been elected by the University of Edinburgh's Senatus Academicus to give the biennial "Romanes Lecture in Chemistry for 1951." Dr. Egloff, who is vice president of the Third World Petroleum Congress, will attend the Third Congress, in The Hague, May 28 to June 6, 1951, at which time he will lecture on "Polymerization of Olefinic Hydrocarbons."

R. O. Major, formerly engineer with the Abilene, Tex., district office of the Texas Railroad Commission, has joined Bankline Oil Co., of Midland, Tex., as geologist engineer of the firm's Eastland County operations.

F. A. Smith, general superintendent for Canadian Oil Cos., Ltd., has been named manager of manufacturing, and **V. M. Norwood,** plant superintendent, was named general superintendent of the Petrolia refinery of the company. Smith has been associated with Canadian Oil since 1919, joining the firm as chief chemist. In 1934 he assumed additional duties as assistant superintendent of the firm's refinery at Petrolia. In 1936 he was named superintendent and subsequently became general superintendent. Norwood joined the firm in 1935 following his graduation from University of Toronto. In 1941 he was named chief engineer and in 1943, plant superintendent.

F. C. Havens, assistant to the regional general manager of Continental Oil Co., at Los Angeles, has been transferred as treasurer to Platte Pipe Line Co., an affiliated company located at Independence, Kans. **Olen Lane,** regional manager of exploration, will succeed Havens at Los Angeles as assistant regional general manager. Other changes in the western region office include: **R. M. Barnes,** regional geologist, named regional manager of exploration; **James B. Anderson,** assistant regional geologist, named regional geologist; and **Rufus M. Smith,** geologist, named to the newly created position of assistant to the regional geologist.

Henry P. Hellinghausen has resigned as treasurer of Interstate Oil Pipe Line Co. to become manager of the southern division with offices at Shreveport, La., succeeding **W. C. Taylor,** who has retired. **Phelan H. Hunter,** Tulsa, a director and secretary of Interstate, has been elected to the additional post of treasurer of the organization by the board of directors, as successor to Hellinghausen.

J. W. Pegg, manager of Shell Development Co.'s New York office, has been named vice president of the firm. He will be in charge of the New York offices of Shell Development, the research affiliate of Shell Oil Co. He joined Shell in 1937, was named executive assistant to the vice president of marketing in 1945, and manager of the New York offices in 1949.

I. C. Murphy, Shell Pipe Line Corp., has been changed from district foreman to district superintendent at Cushing, Okla. Other recent changes in the firm include: **J. E. Fairweather,** station chief engineer, Monahans, Tex., to district chief gager, Goldsmith, Tex.; **L. L. Gentry,** district gager to district chief gager, Elyria, Tex.; **J. A. Scheineman,** junior engineer to engineer, Cushing; **N. F. Schreiner,** acting area manager to area engineer, Cushing; **H. P. Shockley,** district gager to district chief gager, Avant, Okla.; **T. L. Stewart,** junior engineer to engineer, Cushing; **L. T. Cain,** district gager to district chief gager, Iraan, Tex.; and **J. V. Williams,** equipment installer, Cushing to Tulsa.

K. E. Stober has been named plant manager of Dow Chemical Co.'s new Styron plant now under construction at Allyn's Point, Conn. He joined Dow in 1936, after receiving a chemistry degree from Montana State College, and has been a production superintendent in the Styron division at Midland, Tex., since 1947.

George F. Getty, II., has been elected assistant secretary-treasurer of Pacific Western Oil Corp., Los Angeles. For the past 18 months he has been manager of the firm's operations in the Middle East.

Kenneth E. Hill, petroleum engineer, has been named second vice president in the petroleum department of the Chase National Bank, of New York City.

Dr. Charles W. Beckett has been appointed to the thermodynamics section of the National Bureau of Stand-

GEOPHYSICAL SOCIETY OFFICERS.—Newly elected officers of the Permian Basin Geophysical Society, Midland, Tex. Seated left to right: C. W. Payne, Pure Oil Co., president; E. L. Mount, Continental Oil Co., first vice president; and C. N. Page, Honolulu Oil Corp., second vice president. Standing: G. A. Grimm, Tide Water Associated Oil Co., treasurer; and L. G. Cornish, Seismograph Service Corp., secretary.

How to work an oil field

without winding up in the hole!

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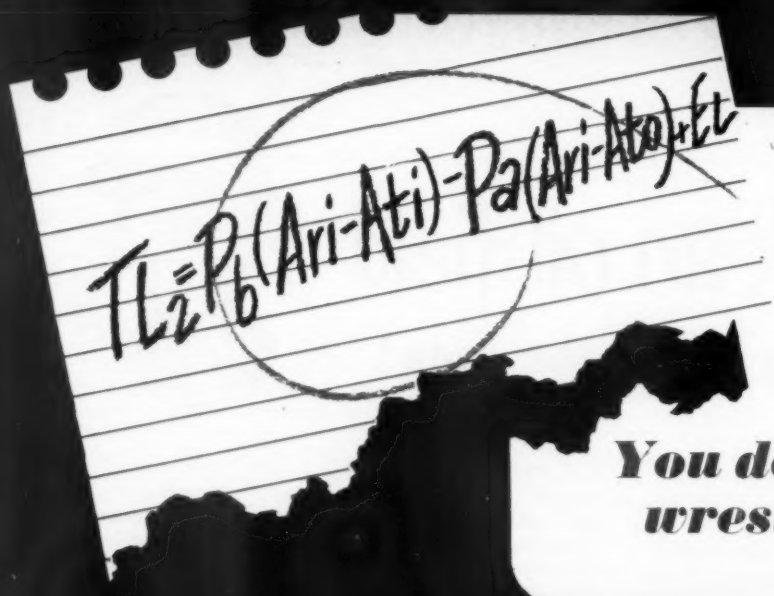

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PERSONALS

ards where he will be active in the preparation of tables of thermal properties of gases.

E. A. Kermott, general manager of the White Eagle division of Socony-Vacuum Oil Co., Inc., will retire January 1. He has been in the oil business since 1907.

W. M. Jones, Stanolind Oil & Gas Co., Longview, Tex., has been elected chairman of the East Texas chapter of the American Petroleum Institute. **W. A. Holland,** East Texas Engineering Association, Kilgore; **C. R. Stevens,** Humble Oil & Refining Co., Gladewater; and **J. A. Williams, Jr.,** The Texas Co., Gladewater, were elected vice chairmen. **Frank Folger,** Stanolind Oil & Gas Co., Longview, was made secretary-treasurer; and **W. G. Sole,** Magnolia Petroleum Co., Kilgore, assistant secretary-treasurer.

Sam H. Casey, Shreveport, has been named assistant to **R. J. Diwoky,** executive vice president of Pan-Am Southern Corp., with headquarters in New Orleans. **John E. Brewster** succeeds Casey as assistant manager of the crude-oil-purchasing department. Casey joined Root Petroleum Co. in 1948 as manager of the crude-oil-purchasing department. Root was later merged into Pan-Am Southern. Brewster joined Root's pipe-line department at El Dorado, Ark., and was transferred to Shreveport as assistant to Casey earlier this year.

Presley E. Vinson, formerly independent oil operator in Mississippi, Louisiana, and Texas, has joined Amerada Petroleum Corp. in Houston as land-department representative.

Charles E. Lane has been named assistant treasurer for Gulf Oil Corp., succeeding **W. F. Lund** who has resigned. Lane joined the firm in 1916.

John C. Lane, former head of the information service of the Institute of Gas Technology, Chicago, has been appointed head of the technical-information service of the Georgia School of Technology Engineering Experiment Station, and research professor of the school. He had previously been employed by Gulf Research & Development Co., Pittsburgh. **Dr. Joseph J. Moder, Jr.,** associate professor of industrial engineering at Georgia Tech, has been appointed faculty research associate professor of the experiment station.

Joseph A. McIntosh, Michigan district geologist for Cities Service Oil Co. at Mount Pleasant, has been transferred to Billings, Mont.

Preston McGrain, assistant state geologist for Kentucky Geological Survey, has been transferred from Indianapolis to Lexington, Ky.

J. E. Vaeth, G. B. Magruder, Jr., and **W. H. Strong,** formerly with Danciger Oil & Refining Co., Fort Worth, were named vice presidents of Southern Production Co., Inc., Shreveport, as the result of the merger of the Danciger and Southern companies. Magruder also becomes an assistant secretary, and Strong an assistant treasurer. Southern will continue to operate the Danciger offices at Fort Worth. Other officers of Southern include: **C. T. Chenery,** New York City, board chairman; **H. Gordon Calder,** Shreveport, president; **C. D. Stephenson,** Shreveport, vice president; **T. S. Stoneman,** Baton Rouge, La., vice president; **Roy C. Williamson,** vice president; **H. T. Ellwood,** secretary-treasurer, and **Henry C. Calhoun,** assistant secretary, all of Shreveport, and **Elizabeth C. Ham,** New York, assistant secretary, and **A. P. Barnes,** Shreveport, assistant treasurer.

Joseph D. Tompkins and **Philip Gully** have announced the opening of the firm of Tompkins & Gully, consulting geologists, Abilene, Tex. Tompkins has been a consulting geologist in Abilene since his release from the Army in 1946. Gully recently moved to Abilene from Beeville, Tex., where he has been in consulting work for the past 15 years.

C. G. Brock, junior engineer for United Gas Corp., has been transferred from the Houston general office to the Beaumont, Tex., division of the firm.

Ernest E. Evinger, formerly petroleum engineer in the Odessa, Tex., division of Shell Oil Co., has moved to Midland, Tex., and is now associated with **A. N. Hendrickson,** independent oil operator.

***NEW OFFICERS.**—Above are the officers of the Rocky Mountain Oil and Gas Association who were elected last week in Denver. Left to right, Glenn E. Nielson, Husky Oil Co., Cody, Wyo., past president; Charles S. Hill, independent operator, Denver, president; Walter Davis, independent operator, Casper, Wyo., treasurer; J. P. Moroney, Sinclair Oil & Gas Co., vice president; and Zack K. Brinkerhoff, Brinkerhoff Drilling Co., Casper, vice president.*

DEATHS

Clyde B. Wellman, 66, superintendent for Wrather Petroleum Co., and a partner of Henry Livingstone, of Fort Worth, was accidentally killed December 8, while on a hunting trip.

Leon P. Powell, 79, San Angelo, Tex., oil man, died there December 9.

Porter D. Hansen, 56, Dallas oil man, died December 8 in Dallas. He was vice president of Texhoma Oil Corp. of Oklahoma City.

Charles L. Lockhart, 57, manager of Shell Oil Co.'s Sewaren, N. J., marine terminal, died December 2 in Detroit.

George D. Williams, 53, independent oil operator, died in Houston December 3.

Charles Wagner, 53, petroleum geologist and independent operator at San Antonio, was killed in an oil-field accident near Devine, Tex., on December 5.

Bates Cox, 74, veteran employe of Texas Pacific Coal & Oil Co., died December 4 at Thurber, Tex.

George R. Bennett, 43, Midland, Tex., oil-field supply salesman with Hughes Tool Co., died in Midland December 8.

XUM

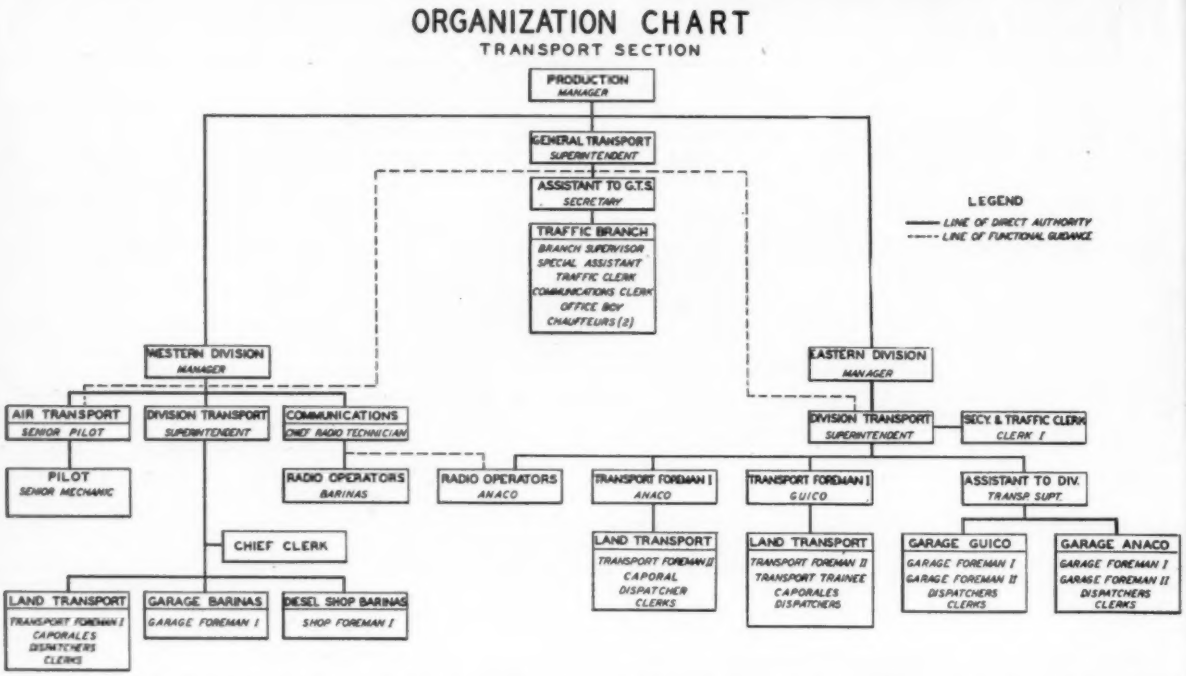


Fig. 1—A streamlined organizational setup is important to better coordination of transportation problems. This chart shows Socony-Vacuum's transportation division organizational layout for its Venezuelan operations.

Here's how Socony-Vacuum conducts

TRANSPORT IN VENEZUELAN OPERATIONS

In order to "keep 'em rolling" where highways are few, everyone responsible must exercise unceasing attention

by George F. Kendall*

VENEZUELA, with its 352,143 sq. miles, almost one-third larger than Texas, had as of December 1949 no more than 1,045 miles of good hard-topped roads. About 50 per cent are in various parts of the country serving the oil industry for the purpose of hauling materials for exploration and exploitation work.

Most of Venezuela's hard-topped roads were originally built by the oil companies and, in many cases, maintenance is still an oil-industry burden. For the size of the country the ratio of good roads, compared with Texas, is very small and, though rapidly increasing, it presents the oil operators with a fundamental transport cost far in excess of anything experienced in Texas.

The operating companies have many millions of dollars invested in land, air, and water-transport equipment to cope with the requirements of exploration and exploitation operations in the varied types of terrain met with such as mesa, mountains, high forest, river, lake, and swamp.

Partners to the equipment investment are the personnel that make it work, each in himself a further investment. This dual investment requires contant and careful supervision. However, the problems involved in oil-field transport in Venezuela are not unique and are generally the same as those encountered in most foreign oil-field operation. Some of these are the following:

1. The need for setting up and operating complete maintenance facilities in many locations.

2. Necessity of carrying heavy stocks of replacement parts.

3. Accident damage to vehicles due to unskilled handling.

4. Necessity of training all personnel in the necessary skills.

5. High cost of operating these services.

The operations discussed here pertain solely to those of Socony-Vacuum Oil Co. of Venezuela, which incidentally are only a small part of the whole industry.

The Socony-Vacuum fleet in Venezuela has grown, since its infancy some 10 years ago, from a half dozen assorted vehicles to its present total of 531 units. Included in the present fleet are light passenger vehicles, buses, heavy oil-field trucks and trailers capable of hauling up to 65 ton loads, light and heavy tractors, as well as road-building and maintenance equipment. Socony-Vacuum also operates one C-47 airplane. Jeeps are attempting to displace the slower mules used by field geological parties in working sections of the country where it is impossible to use ordinary motor-vehicle equipment during the rainy season.

Organization

The organization of Socony-Vacuum's transport section is shown in Fig. 1. The general transport superintendent is headquarted in Caracas in order to be in a better position to

*Socony-Vacuum Oil Co. of Venezuela.

One of the problems of the transportation section is moving rigs and other drilling equipment. Crawler-type units as well as conventional heavy-duty trucks are under the jurisdiction of the transportation section.

The garage foreman and his assistant at Anaco camp proudly display the division's lost-time accident record.

coordinate all transport problems for management. Also attached to the office of the general transport superintendent is a traffic branch which is charged with the responsibility of making personnel travel arrangements both by local and foreign airlines and steamships, coordinate the operations of and dispatch of the company airplane, coordinating freight and cargo movements from the headquarters area and handling radiophone traffic between general offices in Caracas and field camps.

Terrain

The terrain over which the fleet operates runs the gamut from good-to-fair hard-surfaced black-top roads through gravel or semigravel lease roads, mule trails (both sandy and swampy), and outright jungle. As a producing property is developed the company improves road conditions in relation to their importance and permanence. Nevertheless the better-class roads are in the minority.

In Eastern Venezuela, the terrain over which exploration is carried out usually consists of country with some relief, from gently rolling plains to extremely steep and rough hill country, the surface being mostly sand or clay. In the rainy season it is necessary to use chains and do a great deal of winching, in the clay country. During the dry season the major difficulty is with steep hills where it is often necessary to winch trucks up perfectly dry slopes.

In southwestern Venezuela the terrain is low, mostly flat plains and the surface is usually heavy loam. In the dry season, in many places, the ground cracks as it dries into brick-like lumps called "terrones." These lumps range from the size of a baseball to several feet in diameter. In the rainy sason much of southwestern Venezuela is far too wet and swampy to use trucks at all. Tractors with light two-wheeled trailers have been found the most satisfactory vehicles for the transport of men and equipment, under these conditions.

On seismograph parties it is necessary to make at least a passable road along each seismic line. Sometimes each party requires as much as 100 km. of this road per month. Previously all of this road work was done by labor gangs with axes, machetes, and shovels. It has been found that this work can be done much more economically by using one or two bulldozers per party and occasionally doing some work with a crawler-type-tractor motor patrol. Experience has shown that one bulldozer will replace 30 to 40 laborers and build a better road than could be built by hand, thus helping to decrease the wear and tear on motor-vehicle equipment.

The majority of Socony-Vacuum's equipment operates under conditions which take their toil in excessive motor and running-gear wear and considerably shortens the economic useful life of the vehicles. Equipment used in exploration work usual-

This truck, caught in a flash flood while hauling drilling equipment in Venezuela, presents another problem to the transportation section. Looking over the situation is Socony-Vacuum's division transport superintendent and transport foreman in Venezuela.

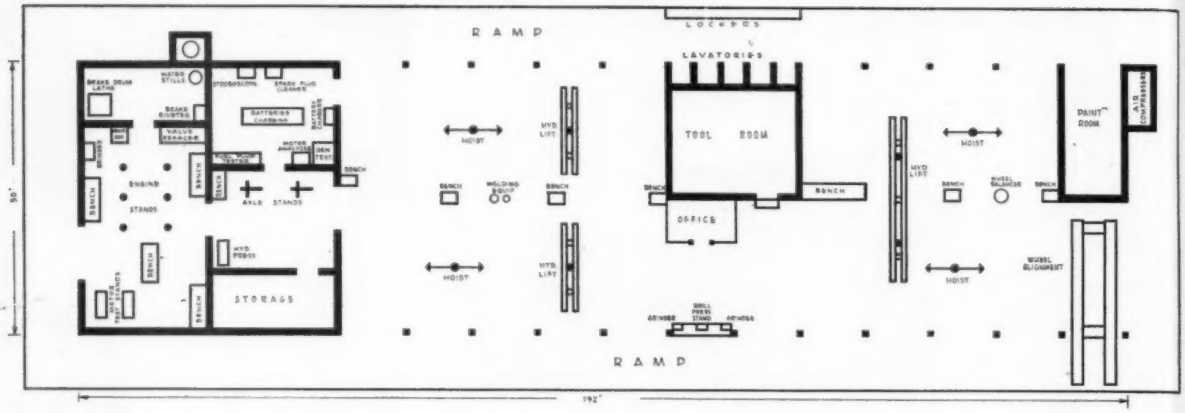
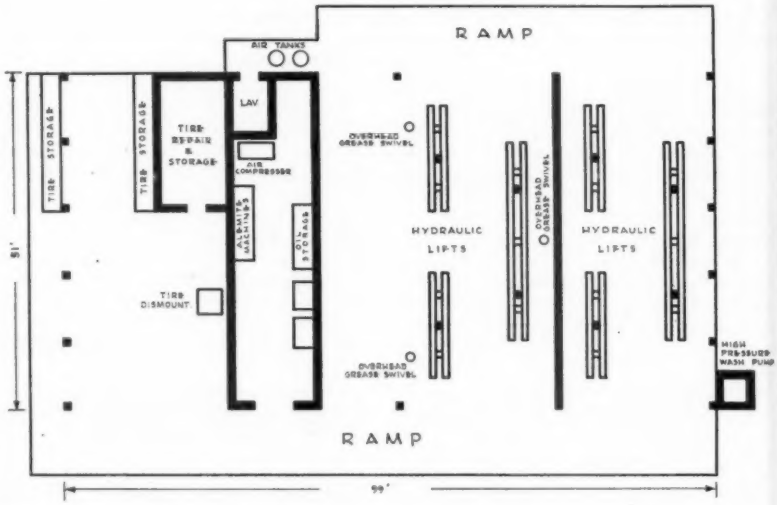


Fig. 2—(Above) The main garage building accommodates 18 vehicles.

Fig. 3—(Right) Located adjacent to the main garage the service building is large enough to handle eight vehicles on its wash rack and a like number on the greasing rack.



ly requires complete overhauling after one season's work (6 months).

Maintenance

In the initial stage of operations the lack of sufficient and well-equipped garages, trained personnel as well as a full complement of vehicles to carry out the work load, resulted in inability to provide adequate preventive maintenance. This resulted in the rapid deterioration of the vehicles and costly road breakdowns which appreciably reduced the economic life of the equipment. This condition was greatly improved, especially in the eastern division, where early in 1948 the main fleet maintenance and terminal depots were centralized in the company's newly completed Anaco camp in the state of Anzoategui. There the company erected modern garage and service facilities. Not the least of the results produced by the transfer to those new facilities was the vast improvement in shop-personnel morale. A more intensive preventive-maintenance program, made possible through this move, has shown definite improvements in operating economy, has reduced road breakdows, and helps to keep the fleet in as near top condition as possible.

The main garage building measures 192 by 50 ft., having 18 stalls accommodating a like number of vehicles. This layout is shown in Fig. 2. The building also contains a completely enclosed motor-overhaul room, battery-service room, used-parts storage room, and paint room, as well as office space, tool room, and complete wash room and locker facilities for shop personnel.

A service building, where all washing, lubricating, and tire repair is carried out, measures 99 by 51 ft., being adjacent to the garage. This layout is shown in Fig. 3. Separate stalls are equipped for washing, greasing, polishing, and tire-repair work. Four vehicles can be washed simultaneously and another four can be lubricated at the same time. This building is also equipped with enclosed storage room and wash-room facilities.

The preventive-maintenance program provides that all units within the division are completely serviced and inspected for mechanical defects twice a month. To accomplish this each unit is assigned a fixed service date. Those vehicles which are not brought in for servicing can easily be identified from a master chart which is maintained in the service building. They are reported daily to the division transport superintendent who diligently follows up each case with the department or section concerned. This is the important feature of the program because no amount of modern facilities nor well-planned programs will guarantee results unless they are made to work. The facilities will take care of approximately 500 units. The investment in the whole installation is close to $215,000.

Supplies

The company maintains a large auto-parts warehouse in Anaco, which is situated in the maintenance and terminal depot near the main garage for ease of access. This warehouse carries approximately $150,000 worth of Ford, Chevrolet, and Mack parts. Fully 90 per cent of all operating supplies, automotive replacement parts, tires, batteries, etc., are imported from the United States. Careful control must be exercised in scheduling of orders (a joint responsibility of the materials and transport sections) so that stocks are kept close to the consumption level. Unbalance here gives rise to additional expense. Overstocking means money tied up and increases the risk of obsolescence. Understocking means possible costly delays or shutdowns and the necessity of paying higher prices on the local market. Moreover, the local sources of supply and communications usually are such, in relation to the areas of operation, that they cannot be depended upon. It is attempted, under normal circumstances, to carry at least 6 months' requirements in stock and on order to replace usage on a consumption basis.

Damage to Vehicles

Prevention of damage to vehicles through accidents is an operating problem of any large fleet owner.

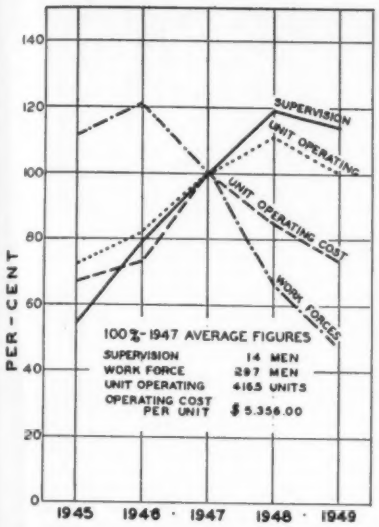


Fig. 4—The statistics charted here are on Socony-Vacuum's Eastern division transportation operations in Venezuela.

Several years ago, Socony-Vacuum's accident-frequency rate was such that one vehicle was involved in a damaging accident almost daily, i.e., dented fenders, rollovers, backing collision with fixed objects, animals, and so on. It became obvious that a major problem was the careless and incompetent handling of equipment by both professional and nonprofessional drivers. The latter are employes provided with vehicles to facilitate carrying out their assignments.

Good progress is being made through driver-training courses being given to all personnel required to drive company vehicles. These driver-training courses are given under the guidance of the safety and training section of the company, with the transport section taking an active part. Early in 1948, traffic-accident investigation committees were formed, consisting of representatives of the transport, safety and training, and industrial-relations field sections of the company. These committees closely investigate all accidents involving company vehicles occurring within their jurisdiction to establish cause and responsibility, to see that the proper reports were completed by those involved and make recommendations to management for any corrective measures, payment of damages in accordance with company policies, or disciplinary action when necessary.

Driver records and traffic-accident statistics are maintained by the safety and training section and accurate traffic-accident-frequency rates are calculated monthly. There is little doubt that the work of these committees has been effective in highlighting traffic-accident causes and all employes are more aware of their responsibility to the company in the handling and treatment of company equipment.

Training Programs

A driver-training program was inaugurated by the company's safety and training section in August 1949. Initially, 10 employes were given complete courses in driver training. These driver trainers were selected from various departments and sections of the company and were given training for 2 hours per day, 3 days per week for a total of 10 days. These men then began the training of drivers in their departments or sections.

Driver training includes detailed instruction and testing on such points as: checking the vehicles before starting; starting the motor; clutch and gear-shift handling; speed control; brakes; steering; backing; hand signals; passing other vehicles, and proper position on the road. In addition, psycho-physical tests are given for visual acuity, night vision, resistance to glare, hand stability, simple reaction time, field of vision, depth perception, and color vision.

Traffic safety films are shown to all employes to impress good driving habits upon them. The safety and training section also checks driver applications and retrains accidentees. To date most employes required to drive company vehicles have been given at least one driver-training course. Local government traffic authorities and officials have shown a great interest in this program and have cooperated with the company wherever possible. They have been invited to special demonstrations and film showings dealing with traffic safety, in field camps. Other projects at present in progress in connection with the over-all driver training program in the fields are as follows:

1. Recommendations to traffic authorities on the erection and design of road traffic signs and road markings, where indicated.

2. Establishment of driver awards and driver trainer indentification.

Undoubtedly, this program has resulted in reducing the number of automobile accidents involving company personnel. The present traffic-accident-frequency rate per 100,000 miles operated is 1.12, as compared with the latest figure available from the United States of 2.70.

Early in 1949, an outstanding Venezuelan garage foreman was sent to the United States for a period of 6 months to receive a course in automotive mechanic instruction. Upon his return from the United States an automotive mechanics training course was inaugurated in July 1949. The approach to this program is the use of classroom time to teach theory and principles, followed by on-the-job instruction. Each group of students received 45 classroom hours of instruction, as follows: generator, 5 hours; regulator, 5 hours; ignition, 12 hours; battery, 9 hours; brakes, 9 hours; and carburetor, 5 hours. Attendance during these courses has been excellent, some of the men appearing for classes on their own time during their vacations. In addition to the class instruction, visual-aid slides are used to illustrate various techniques in automotive mechanics and special instruction is given in the use of various testing equipment.

After the mechanics training course has been completed, each student is required to present a written examination, the results of which, to date, have been considered very satisfactory. Generally speaking, all first and second-class mechanics present satisfactory final examinations on their first attempt, while lower-class mechanics usually are required to repeat up to half of the course. Mechanic's helpers, on the average, need to repeat the whole course before passing the final examination. The program has been and continues to be well appreciated by the shop employes who recognize that the company is interested in helping them advance in their chosen trade. It undoubtedly has paid dividends in reducing the number of return jobs as well as increasing the general output of the garages. These courses have helped the company to reach the unusually low mechanic-to-unit ratio of 1 to 11.3.

The company has also in operation a planned program for training promising young Venezuelan personnel to prepare them for more responsible positions within the transport section. This course, as presently set up, is scheduled to take at least 1 year and

(Continued on page 103)

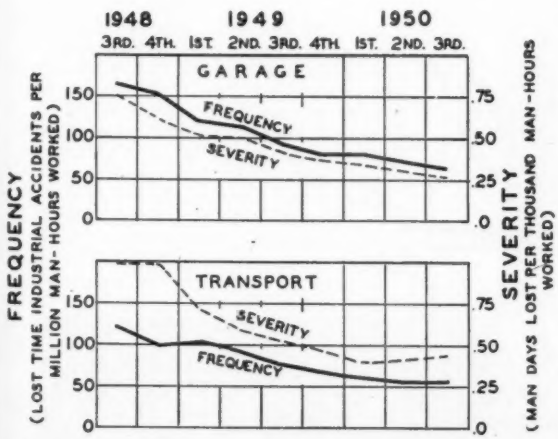


Fig. 5—Industrial accident rates on garage and transport operations. Figures are quarterly cumulative averages.

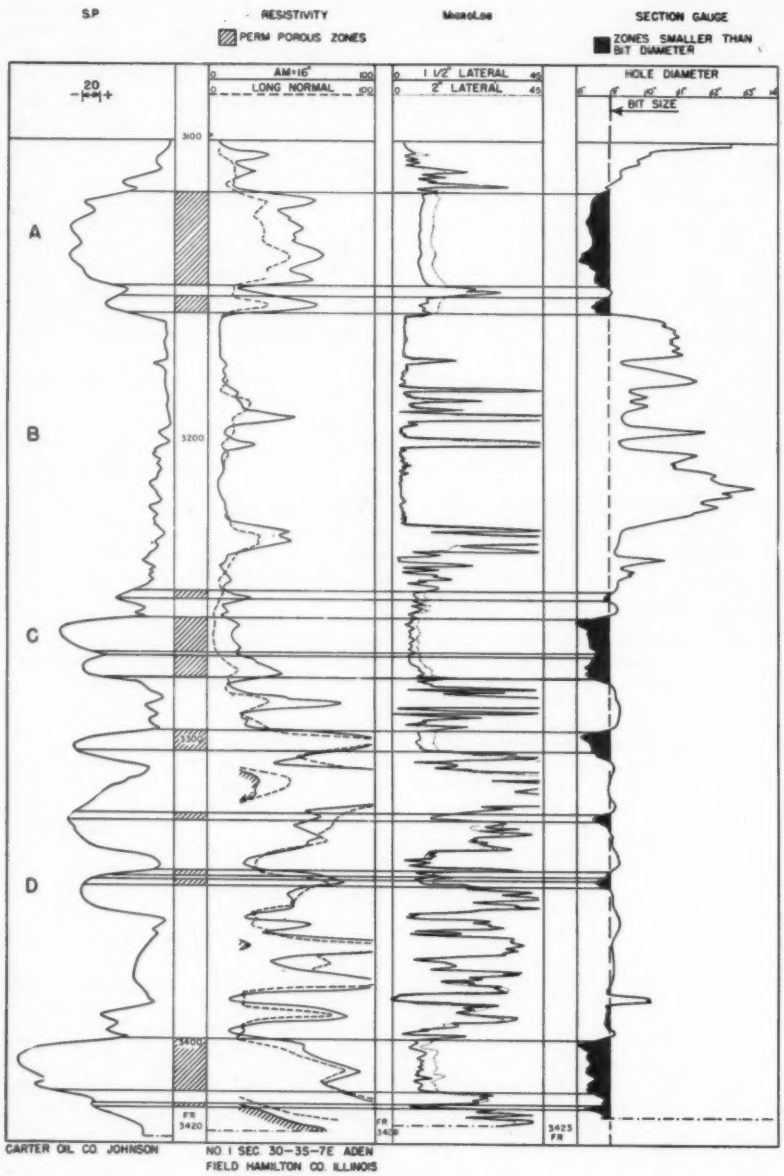


Fig. 1—A typical log.

Practical Application of MICROLOGGING* in the Northeastern United States

by C. A. Doh†

Here is told how to interpret the MicroLog to study lithologic details, particularly permeable zone delineation for the precise determination of net pay thicknesses

THE electrode system for the MicroLog‡ comprises very small electrodes, very closely spaced, and borne by a support of insulating material, generally referred to as a pad, which is maintained in contact with the wall of the hole by means of a spring arrangement. Because of the presence of the insulating pad, the bypass effect of the mud column in the bore hole is practically eliminated.

Limitations imposed on the electrical field in the vicinity of the electrode assemblage as a result of the insulating pad, together with the short distance separating the individual electrodes, result in the measurement of the average resistivities of very small volumes of whatever materials occupy the space extending from the face of the pad a few inches outward.

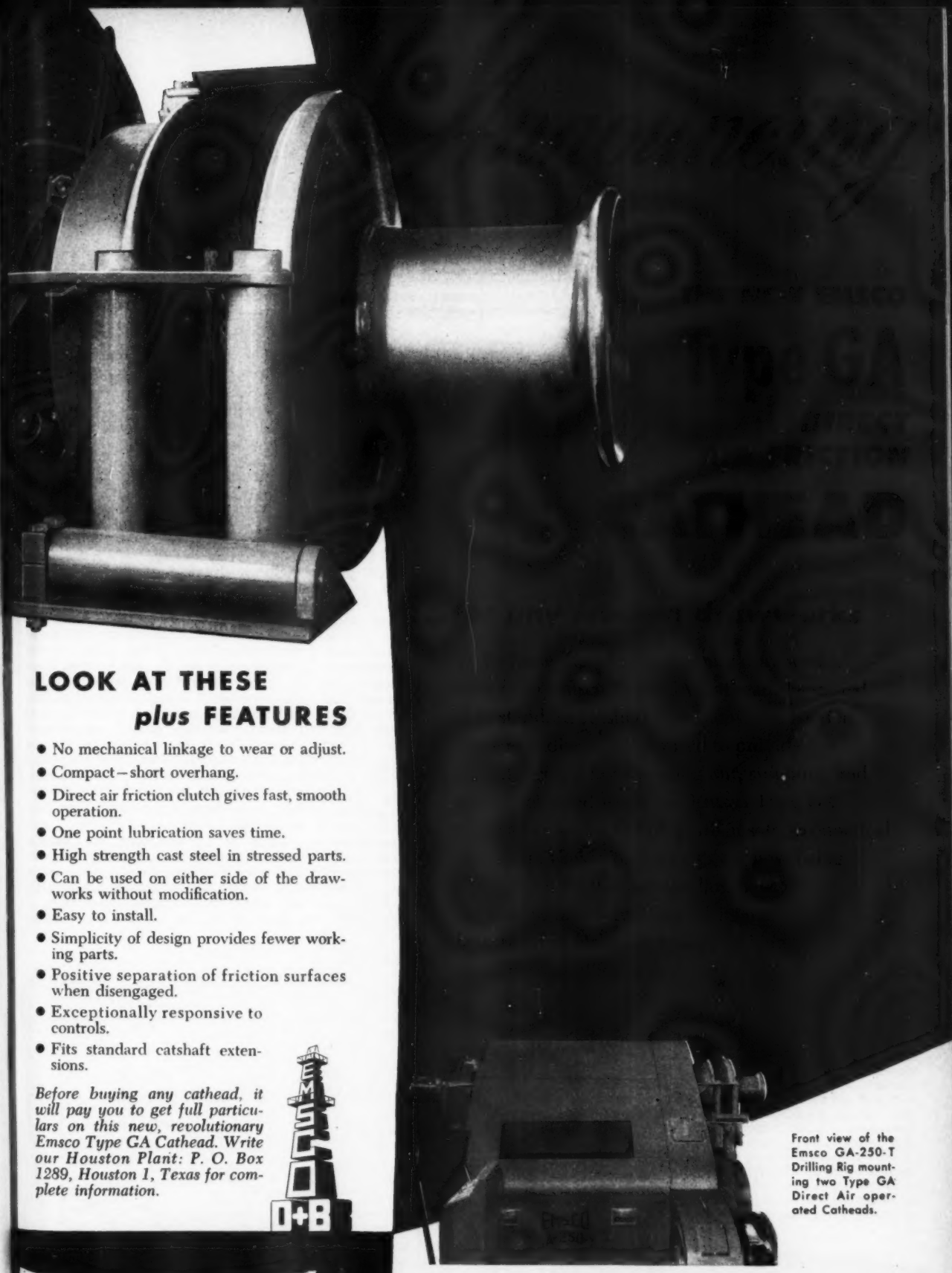
When the electrode system is opposite impermeable beds such as compact limestone or shale, the pad is practically in contact with the formation. The small volumes of material included in the resistivity measurements therefore embrace only the formations themselves, save for a negligibly thin film of mud.

On the other hand, when the electrode assemblage is opposite a permeable bed such as porous lime or sandstone, the pad is prevented from contacting with the formation by the presence of the mud cake deposited on the surface of the bed as the mud filtrate enters the formation. The thickness of this mud cake is some function of the type of mud used, and in the Illinois basin the mud cakes usually range from ¼ to 1 in. in thickness. In such a case, an appreciable fraction of the small volume of material included in the resistivity measurement is occupied by this mud cake, which is normally much more conductive than the material on which it is deposited.

Resistivities of commonly used muds in the Illinois basin vary from 2 to 5 ohm-m. In this range of resistivities the formation factor of the resulting mud cakes is close to one, which means that mud cakes of extreme thickness would show resistivities approximately in the same range as the mud resistivities; namely, 2 to 5 ohm-m. Although extremely thick mud cakes are seldom encountered, the normal mud cakes are thick enough that the average resistivity of the small volume of material included in the measurement is usually lower than that of the permeable formation close to the wall of the hole.

In practice, simultaneous resistivity measurements are made with two short spacings, one including a greater volume of material than the other. The curve recorded using the electrodes which include the larger volume is the curve least influenced by the mud cakes because the latter

*Reg. U. S. Pat. Off. †Schlumberger Well Surveying Corp., Mattoon, Ill. ‡Trade mark of S.W.S.C.



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Front view of the Emsco GA-250-T Drilling Rig mounting two Type GA Direct Air operated Catheads.

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represent a smaller fraction of the total volume of material considered. This curve shows a resistivity closer to that of the formation near the wall of the hole, than does the curve recorded using the electrodes embracing the smaller volume.

The difference in apparent resistivity shown between the two curves is called "separation." The separation is said to be positive if the longer spacing (dotted curve) gives a higher reading than the shorter spacing (solid curve), and negative if the reverse is observed.

It is this separation **in conjunction with the relative value of the apparent resistivity** which permits the distinction to be made between permeable beds and impermeable beds. Thus, a low to moderate resistivity shown by the larger spacing (usually not over 20 times as high as the resistivity of the mud) with positive separation, indicates a permeable bed. A high resistivity (over 20 times the resistivity of the mud) shown by the longer spacing, with or without separation of any kind, indicates a compact formation, while a low resistivity shown by both curves, coupled with no separation or negative separation, indicates a conductive impermeable bed (shale).

Occasionally there may be some exceptions to these simple rules of interpretation, particularly if the formations under study are subject to caving.* It is therefore always advisable to complete the indications of this method of logging with those provided by the conventional log, especially by the S.P. curve.

The essential application of the MicroLogging service is to the study of lithologic details, and in particular to the detailed delineation of permeable zones, permitting precise determination of net pay thickness.

MicroLogging is also helpful for more specific problems. For example, it provides valuable information in wells drilled with salt-water mud, in cable-tool wells, or wells being reworked that become flooded with salt water.*

*Caution must also be used in interpretation if the formations have previously been shot with nitroglycerin. A section gage log is valuable in such cases.

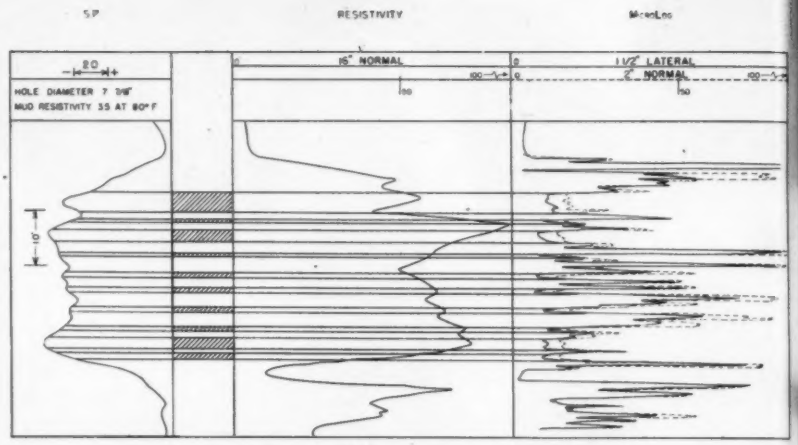


Fig. 2—This log illustrates detail obtained (Bethel sand).

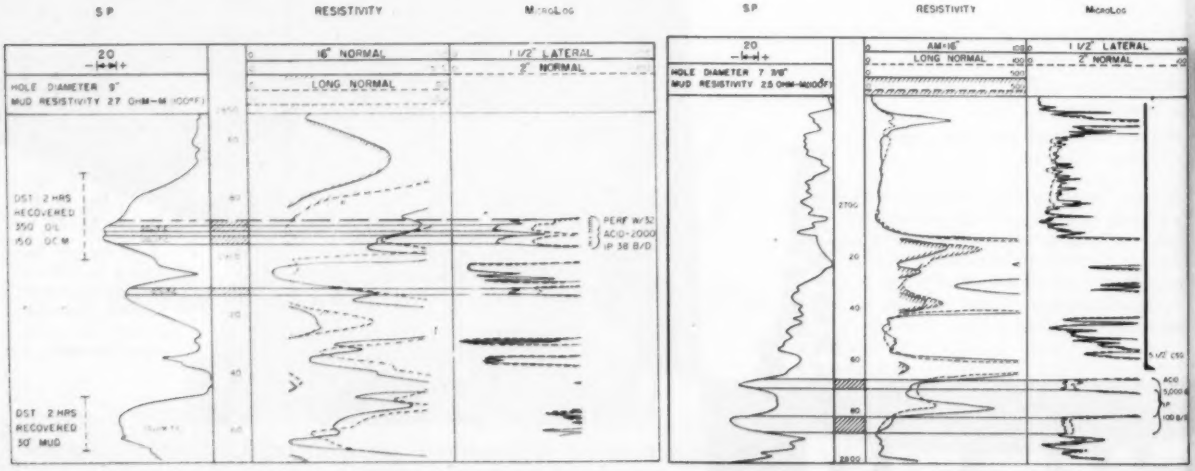
Following Rules

The interpretation rules just mentioned can be followed and understood clearly by reference to Fig. 1, which can be considered as typical of the system's response to the formations encountered in the Northeast. This particular log was selected as an illustration of the principles of interpretation because an amplified section gage log, providing a detailed record of small changes in hole diameter, had also been recorded.

At **A** on the example, a sandstone is indicated by the electrical log. Opposite this section the log shows moderately low resistivity and positive separation between the two curves, which is a good indication that a mud cake is present and therefore that the formation is permeable. However, toward the bottom of the sand zone rather high resistivities with no separation over a short interval are shown. This is a definite indication of an impermeable streak within the zone.

It is logical to assume that, in sandstone, the hole could not be smaller than the bit unless a mud cake was present on the wall of the hole. Throughout the sand except for the thin streak close to the bottom, the section gage shows the hole to be smaller than the bit. Wherever this condition exists, the MicroLog shows moderate resistivity and positive separation. At the level of the impermeable streak, the section gage shows the diameter of the hole to be approximately equal to that of the bit. At this point no mud cake is present and the pad is in contact directly with the formation. About the center of this streak, the MicroLog suggests a thin layer of shale which would explain the deflection of the S.P. curve toward the shale base line at the same level.

At **B** on the electrical log can be seen a predominantly shaly section. The MicroLog reveals a succession of thin tight layers interbedded with the shale. This sequence of layers is confirmed by the sharp variations in



Figs. 3A (left) and 3B (right) illustrate the precise diagnostic value of the logging system.

BAASH ROSS TOOL CO

Baash-Ross News

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OUR 31st YEAR

Every Casing Job Needs This Vital Protection . . .

Baash-Ross Type "UC" Casing Slips

BECAUSE A STRING of casing has a relatively thin wall in relation to its diameter, it is much more easily damaged by unequal slip pressure than are drill pipe or tubing. Yet the weight of a string of casing—particularly under modern deep-hole drilling operations—can be extremely great . . . *so great, in fact, that even a slight misalignment of the slips or a moderate concentration of slip pressure can cause serious damage to the casing and might even result in losing the casing string down the hole.*

But such risks are now minimized through development by Baash-Ross of a new type of casing slip—the Baash-Ross Type "UC" Casing Slip. The Type "UC" Casing Slip consists of multiple segments, flexibly linked together so that they *w-r-a-p* around the casing like a chain tong to fit the exact curvature of the casing. Each individual slip segment takes the *same* uniform grip on the surface of the casing because *all* of the segments are unitized together—*act* as a unit, *set* as a unit, *grip* as a unit. This assures uniform slip pressure around the full circumference of the casing, eliminating risk of concentrated pressures that crimp the pipe and egg-shape the casing.

THREE BASIC BODY SIZES HANDLE WIDE RANGE OF CASING DIAMETERS

And here's an important point . . . Only *three* basic body sizes of "UC" Casing Slips are needed to handle *all* popular casing sizes from 7⅝" through 13⅜". As shown in the accompanying table, interchangeable liners are available for each of the three basic body sizes so that each size can be readily adapted to fit different casing sizes within its operating range . . .

Basic Body Size "UC" Casing Slips. . . .	13⅜"	10¾"	9"*
Interchangeable liners available to fit.	13⅜"	10¾"	9"
	11¾"	9⅝"	8⅝"
			7⅝"

**Fits bore and taper of standard rotary table.*

LINERS EASILY REPLACED

The liners in "UC" Casing Slips have ample length and are so designed that they will cut through pipe scale and any surface coating on the casing to take a firm, slip-proof grip *without damaging the surface of the casing itself.*

And if at any time after long usage, the liners become dull—or when changing from one casing size to another as outlined above—they can be quickly and inexpensively replaced. Simply pull a stainless steel pin, replace the old liner with a new one, slide the pin back in place and the job is done. The stainless steel pins eliminate risk of corrosion and assure easy liner replacements. Furthermore, it is important to note that none of the load of supporting the casing string is placed on retaining pins, bolts or any other parts that can become sheared or lost in the hole. *For maximum safety and strength all weight on the liners is transferred directly to the Slip body itself!*

HERE IS WHY *every casing job needs the protection of Baash-Ross "UC" Casing Slips!*

Because casing has a thin wall in relation to its diameter, it is easily crimped or damaged by even small misalignments that would not affect thicker-walled drill pipe or tubing.

If casing diameters vary slightly or if the slips are not set at exactly the same level, conventional rigid-type slips cause concentrated slip pressure that can crimp, bottle-neck or squeeze the casing out-of-round.

Such damage not only risks dropping the casing string, but the bulged or egg-shaped areas can cause poor joint make-up as well as tight spots through which tools cannot pass. Moreover, wear concentrated on the bulged spot leads to premature casing failures.

The flexible unitized design of Baash-Ross Type "UC" Casing Slips eliminates risk of one portion setting higher or lower than the other . . . and the multiple narrow segments assure an accurate, safe grip that exactly fits the curvature of the casing.

RESULT—there is no concentrated slip pressure—no misalignment of slip segments—no risk of damaging the thin walls of even the longest and heaviest casing strings!

Type "UC" Casing Slips are light, compact and easy for the crew to handle on even the longest and heaviest casing jobs. And they are so inexpensive that every casing job you run can have the protection of this new slip advancement. Your nearest Baash-Ross representative will be glad to supply full details . . . or write direct.

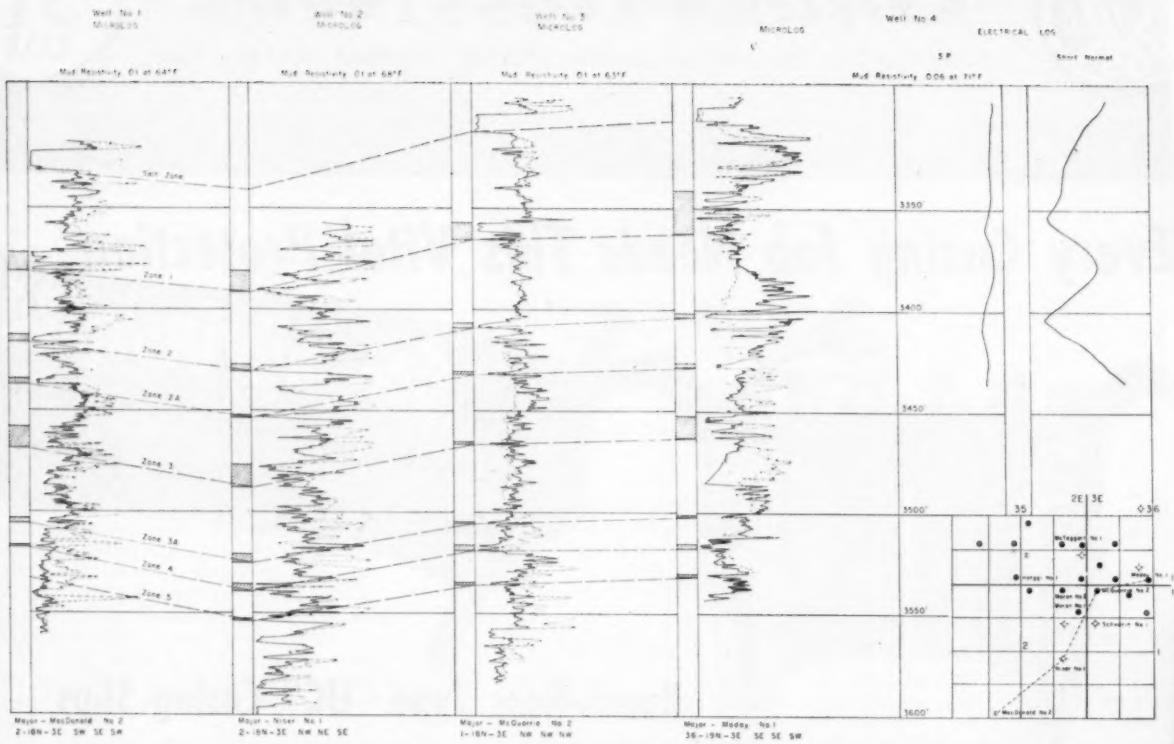

Fig. 4—Cross-section of Richfield zone, South Adams pool, Bay and Arenac counties, Michigan. All depths subsea level.

hole diameter from the enlarged sections opposite the shale streaks to the smaller sections opposite the compact streaks. These interbedded layers are not so clearly discernible on the regular electrical log.

At **C** on the electrical log a permeable bed appears. Here the log by this method again shows positive separation and the section gage shows the hole to be smaller than the bit. In this case the small variations in resistivity shown suggest the presence of many fine laminations which are not clearly revealed on the other logs.

At **D** on the electrical log appears a succession of compact resistive beds and shale beds with some permeable streaks indicated on the MicroLog. The indications of this method are again confirmed by the section gage as already described.

Throughout interval **D** it is interesting to note that the S.P. curve shows strong deflections away from the shale base line over rather thick intervals, whereas the MicroLog shows low values and positive separation only at the level of those sections within these intervals that have sufficient permeability to take fluid.

Study of Lithologic Detail

A remarkable illustration of the detail obtained from logging by this system is provided in Fig. 2. The presence of some cemented zones scattered throughout this sand body can be inferred from the regular resistivity and S.P. curves, but an accurate determination of their number, thickness, and location is obviously very difficult. On the chart, however, each permeable and each impermeable streak stand out clearly. It is worth mentioning that such a wealth of detail could not be shown so clearly by any other well-logging method. The method contrasts the low resistivity of the mud cake opposite the permeable streaks with the high resistivity of the impermeable streaks themselves. Conventional electrode systems, whatever the spacing or number of electrodes, can at best only differentiate between the resistivities of the individual layers, and the resistivities may not be greatly different because the presence of oil in the pervious layers may cause their resistivity to approach that of the cemented layers.

Location of Permeable Zones

As already stated, permeable layers generally correspond to regions of low resistivity with positive separation on the MicroLog.

One instance in which this type of

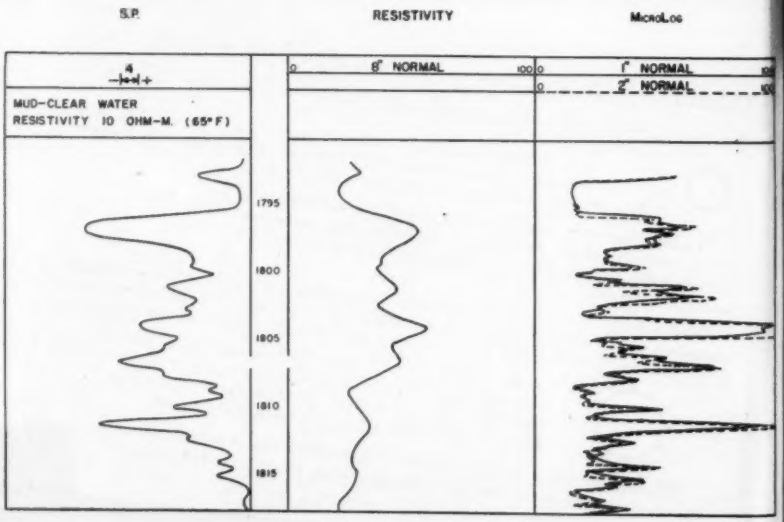

Fig. 5—Bradford third sand.

13 in '49

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Of these 13 major projects, 8 were for clients for whom HUDSON had previously engineered and constructed complete plants . . . good evidence of the satisfaction of owners and operators of HUDSON built plants.

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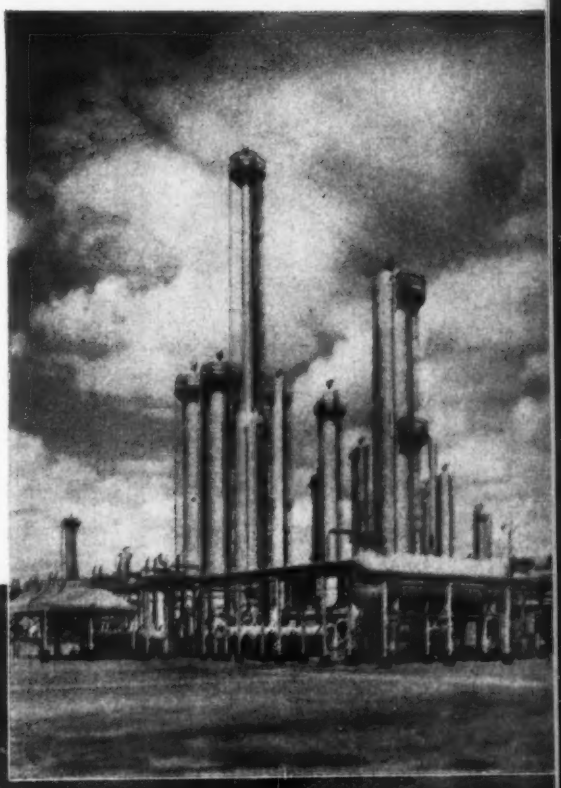

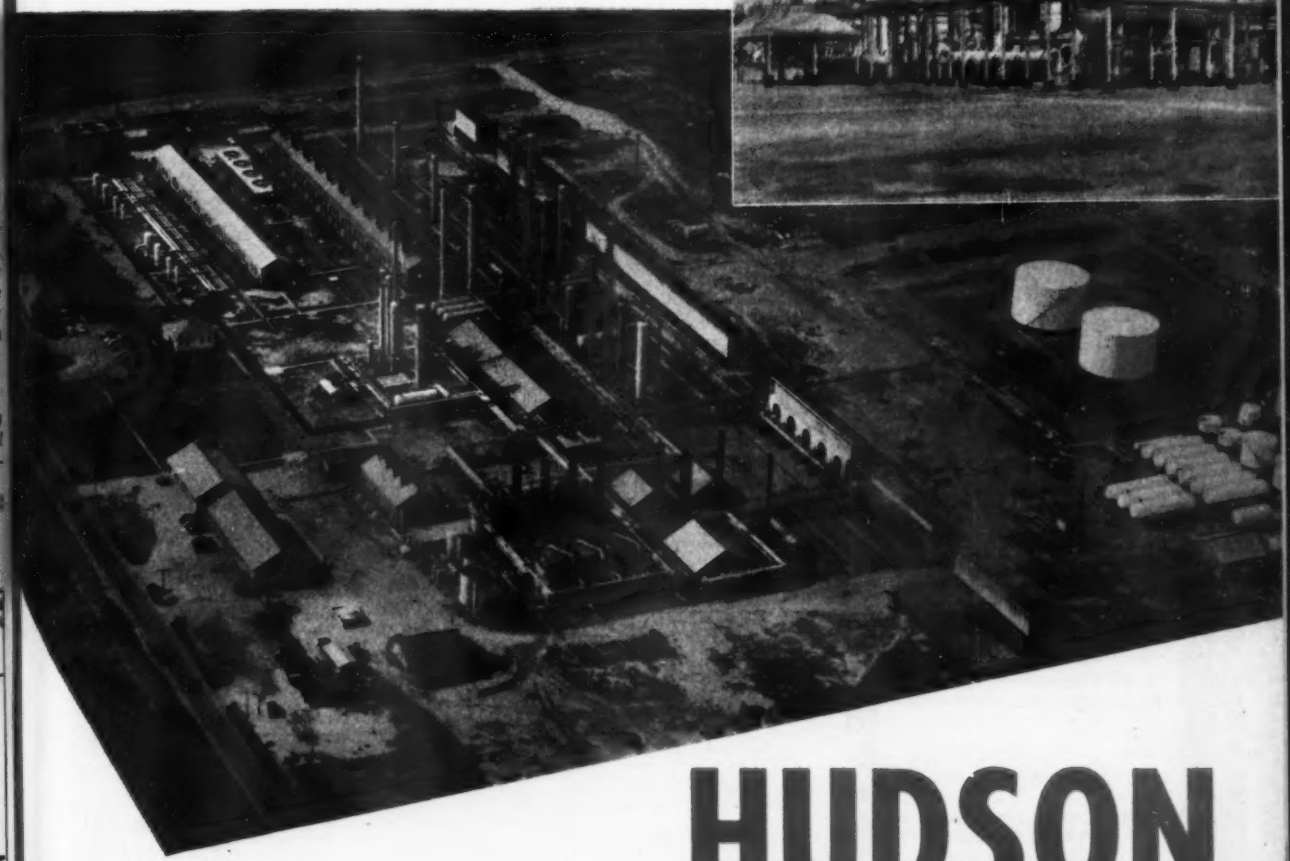

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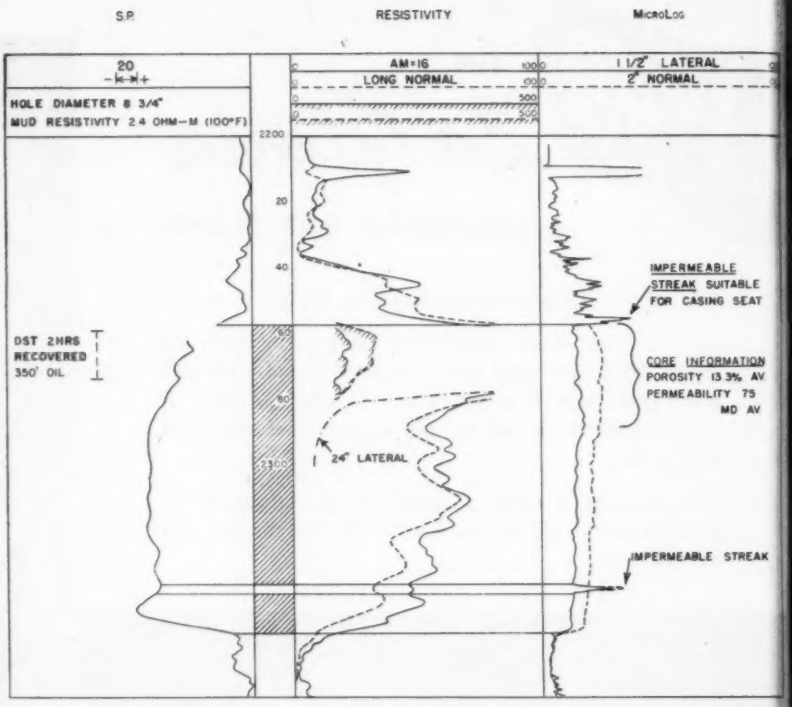

Fig. 6—Example of utilizing the log for accurately setting casing.

logging has proven of great value is in the investigation of dolomites. In the Illinois basin these formations give large negative S.P. anomalies even if they are practically impervious, and these anomalies can be easily confused with those given by permeable oolitic limestones. Moreover, dolomites have comparatively low resistivities, so that distinction between dolomite and water-bearing oolitic limestone is very difficult on the conventional resistivity curve.

With the aid of logs by this system, dolomites can be investigated for the presence or absence of permeable zones and the question whether or not to side-wall core or to test can be decided with certainty. It goes without saying that unnecessary tests can be avoided, which makes for good economics.

Illustrations of the precise diagnostic value of the log in such cases are given in Figs. 3A and 3B.

In Fig. 3A, two sections, 2,886-90 ft. and 2,892-95 ft., correspond to low resistivities and positive separation on the log. These oolitic zones have been tested and produced oil.

The rest of the portion of the log shown on the figure contains a sequence of limestones, shales, and dolomites. High resistivities are noticed opposite the dolomites (2,950-64 ft.), which shows that these beds are tight. A drill-stem test of the bottom hole substantiated the evidence given by the MicroLog. Recovery on this test was 30 ft. of mud.

Fig. 3B refers also to a sequence of limestones, shales, and sucrose dolomites. The MicroLog shows very high resistivities except for the two

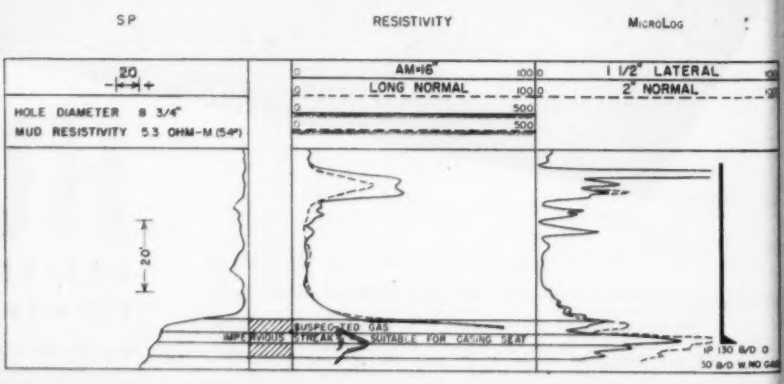

Fig. 7—An example showing how the logging system is used to facilitate a well completion (Walterburg sand).

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Standard-Fryer Drilling Company's rig at Quanah, Texas.

Tool joints being removed from old drill pipe.

Tool joints being installed on new pipe — at the rig.

REED Super Shrink-Grip TOOL JOINTS

Standard-Fryer Drilling Company of Dallas, Texas, reports . . .

We saved a lot because this drill string had Reed Super Shrink-Grip Tool Joints!

"We had an 8,000-foot string of drill pipe go bad at Quanah, Texas and were really lucky the tool joints were Reed Supers.

"In no time at all, we removed the tool joints from the old pipe and installed them on new pipe *at the rig*.

"We saved a long haul to and from a machine shop–and plenty of down time on the rig. In addition, Reed Super Shrink-Grip Tool Joints never give us any trouble."

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sections, 2,766-70 ft. and 2,782-86 ft., which are definitely marked as being permeable by a low resistivity and a positive separation. Negative deflection is observed on the S.P. curve, but it has been observed that S.P. deflections may occur opposite beds with too low a permeability to be productive. After casing was set and acid treatment completed, a production of 100 bbl. of oil per day was obtained from these two permeable intervals.

Logging by this method detects permeable zones regardless of the type of fluid in the formation: gas, oil, or water.

Salt Mud or Salt-Water-Filled Holes

The application of conventional electrical logging techniques is made difficult when extremely salty muds are encountered. The reason is that, with salt mud, the mud column becomes so electrically conductive relative to the formation that most of the current, taking the path of least resistance, is confined to the bore hole, and little of it can enter the formations. As a result, the resistivity diagram is very much flattened and lacking in detail. The S.P. diagram is also flattened. In this case, not only are the ohmic potential drops[2] in the mud column reduced by the low resistance of the latter, but the e.m.f.'s giving rise to the circulating currents that cause the potential drops are reduced to low values.[3]

Because the electrode system is applied to the wall of the hole and shielded from the mud column, this system provides details of the formations that could never have been revealed by the conventional log run in salt-saturated muds.

A good illustration of the value of this method in salt mud wells is given by Fig. 4, which is a cross-section of the Richfield zone of South Adams field of Bay and Arenac counties, Michigan. The correlations were made from the MicroLogs. The map in the illustration shows that the four wells considered span a distance of about 6½ miles.

In this field the conventional logs are often very much flattened because the salinity of the drilling mud is raised almost to the point of saturation when the bit penetrates salt beds above the producing horizon. On the upper right-hand portion of the figure of the MicroLog of well No. 4 is contrasted with the conventional electrical log of the same well as an illustration of the better resolution of the MicroLogging service in such cases.

The formations represented in Fig. 4 are Devonian limestones with vugular porosity. Accurate correlation within a pay zone between adjacent wells is commonly difficult in this type of formation even with the aid of conventional electrical logs recorded under good conditions.

Correlation provided by logs obtained by this method resulted in well No. 4 being completed as a producer instead of being abandoned. A drill-stem test including all the potential pays below the salt zone resulted in a total fluid recovery of 30 ft. of mud. However, the log permitted verification that a normal geological section was present in the well and consequently of the existence at that location of zone 4, known to be productive in the other three wells. After casing had been set and acid treatment completed, the well was completed as a producer at the rate of 100 bbl. per day.

This case suggests the application of this system of logging to problems involving continuity of permeability between wells such as the problems that confront the operators of leases or properties exploited by gas repressuring, or water flooding, for instance.

Applications in Cable-Tool Wells

In the past few years, electrical logging has increasingly found favor in areas exploited by cable-tool drilling. Many economies have been made possible to cable-tool operators by the speed and precise depth control with which reservoir information can be made available through electrical logging.

This logging method is proving of great assistance in helping to solve some of the problems in cable-tool holes. Particularly in secondary-recovery areas, precise delineation of the individual streaks of sand and shale is essential for many reasons. The method provides the detail required in addition to the precision of depth control.

Little or no mud cake is formed in most cable-tool holes for obvious reasons. Under these conditions, the log provides a record displaying faithful response to very thin layers of formation. In Fig. 5 the conventional log and MicroLog of a well in Bradford field of Pennsylvania are compared. The detail provided by the MicroLog is most striking.

Many cable-tool wells penetrate salt-water-producing sands, which may fill all or part of the well bore with extremely conductive water, and make impossible the recording of a good electrical log. The MicroLog, however, as already described, makes possible an analysis of the reservoir under otherwise very difficult conditions.

Applications Suggested in Connection With Well Completions

In the foregoing paragraphs it has been seen that this system of logging is valuable for the appraisal of reservoirs. It is interesting to enumerate the various ways in which the information can be put to use for the more economical and efficient completion of the well. For instance, with the aid of the MicroLog it is possible:

1. To set casing with greater accuracy. The MicroLog not only exactly locates the permeable sections, but it also determines impervious streaks suitable for casing seats, enabling, for example, the casing off of gas caps, and the like.

2. To perform plug-back operations without shutting off any potential pay zones.

3. To selectively gun perforate the permeable zones only, instead of large sections, as in Fig. 1, where 50 per cent of the section may be nonproductive. This reduces the gun-perforating cost considerably and makes every bullet effective.

4. To selectively acidize separate permeable zones to prevent the acid from being absorbed by a few highly permeable streaks, and obtain an ultimately more efficient exploitation of the reservoirs.

5. To place nitroglycerin shots accurately opposite the permeable pay streaks.

6. To evaluate exactly the thickness of the oil-bearing zones, in critical cases, before making the decision to set casing or abandon the well.

7. To study lensing in the pay horizon between wells. This permits a study of the continuity of the individual permeable streaks within a productive horizon and should prove of value in estimating the performance of the reservoir under gas repressuring or water flooding conditions.

An example of the utilization of MicroLogging for an accurate setting of the casing is shown in Fig. 6. The hard streak, distinctly noticed on the log above 2,256 ft. by high resistivities and no separation is a very good casing seat, which is not apparent on the regular log. It is interesting to remark also that the log gives an accurate idea of the lithologic features of the formation. According to the regular resistivity and S.P. logs, the upper part of the bed in this example (2,260-80 ft.) might be suspected as being greatly cemented and therefore tight, whereas the MicroLog shows the bed to be permeable over its entire thickness. This interpretation was checked by a test which gave good oil production.

Fig. 7 is an illustration of the advantage of the MicroLog in facilitating completions of wells under difficult conditions. The presence of a high-pressure gas cap was suspected in this well because an offset well in which casing was set at the top of the zone blew out. In the case of the well illustrated the log showed a highly resistive streak a few feet below the top of the zone. The high resistivity of the layer on the log permitted its identification as a compact and hard streak that should make an excellent casing seat. After completion, according to this interpretation, the well produced 130 bbl. of oil and 30 bbl. of water per day, with no gas.

References

1. H. G. Doll, The MicroLog—A New Electrical Logging Method for the Detailed Determination of Permeable Beds. T.P. 2880, Petroleum Technology, Vol. 2, June 1950.

2. H. G. Doll, The S.P. Curve: Theoretical Analysis and Principles of Interpretation. T.P. 2463, Petroleum Technology, September 1948.

3. R. J. Wyllie, Quantitative Analysis of the Electrochemical Component on the S.P. Curve. A.I.M.E. Technical Paper No. 2511.

Water Flooding in Weber Pool

—Washington County, Oklahoma

by Kenneth H. Johnston* and James A. West*

PART 2

This article is the second in a series of condensations of Bureau of Mines Report of Investigations entitled "Petroleum Engineering Study of Weber pool, Washington County, Oklahoma." Part 1 was published in last week's issue of The Oil and Gas Journal (December 7, 1950, commencing on page 79), and gave a detailed development map of the complete area covered by Weber pool, and location of all secondary-recovery projects; also included was a complete oil-production graph by years for the entire pool, and which showed increased production so far due to secondary-recovery operations. Part 3 of this series will appear in an early issue.

WATER-FLOODING operations started recently in Weber pool, in northeastern Oklahoma, represent the first systemmatic secondary-recovery operations in the field. Four projects are under way and two others are being developed. Although none of the projects are old enough to provide a basis for an accurate estimate of the ultimate recovery by water flooding, it is apparent that good results will be obtained. One 80-acre project, which has just reached a peak rate of production by flooding, has already produced more than 2,100 bbl. of oil per acre.

Keener Oil & Gas Co.—This company was granted a permit by the Oklahoma Corporation Commission, in September 1948, to water flood a total of 285 acres in several tracts in Sections 22 and 27-27n-13e. Development for water flooding has been limited to date to Project 4, an 80-acre tract that previously had been subjected to repressuring.

Gas injection was started in 1927, using a single gas-injection well drilled near the center of the 80-acre tract. The volume of gas injected into the Bartlesville sand through this well was not measured, but all the produced gas not needed for lease operation was returned to the producing formation.

By 1937, the volume of gas available for repressuring had diminished so that it was necessary to abandon the operation, and the gas-injection well was plugged. In May 1939, a contract for gas was made with an adjoining property owner, and an injection well was completed on the south property line. The volume of gas injected into the producing formation through this well was not measured, but it is estimated that 10,000 to 15,000 cu. ft. of gas was injected daily at the start. The injection well was abandoned in 1943, and no additional gas has been injected on this tract.

It is estimated that approximately 382,000 bbl. of oil, equivalent to 4,775 bbl. per acre, or 172 bbl. per acre-foot, would have been produced by January 1, 1950, from this project by primary-recovery methods, and that repressuring resulted in the recovery of approximately 126,000 bbl. of additional oil, equal to 1,575 bbl. per acre, or 57 bbl. per acre-foot.

Development of the 80-acre tract for water flooding was started late in 1948. None of the old wells were suitable for use in the flood, so the lease was completely redrilled on a five-spot plan with a spacing of 660 ft. between like wells, as is shown in the map of the property (Fig. 4). A number of old wells that had been abandoned previously were cleaned out to bottom and replugged to eliminate the possibility of the wells "breaking out" under pressure because of improper plugging.

Development

The development required the drilling of 15 water-input wells and 8 producing wells. Twelve of the water-input wells were drilled jointly on common property lines with offset operators. The operation of injection wells along the Forest Oil Corp. property lines is shared by Forest. Keener Oil & Gas Co.'s operating interest in the 12 line wells surrounding the 80-acre tract is equivalent to 6¾ wells. All but four of the old oil wells were plugged and abandoned before water injection was started. The remaining old wells were used to determine the progress of the water flood and were abandoned when a high water-to-oil ratio was reached.

All wells drilled on the Keener water-flooding project were cored and shot with nitroglycerin. The water-input wells were cased with 20 to 60 ft. of 10-in. surface casing, and 2-in. cement-lined tubing was set on a packer and cemented at the top of the Bartlesville oil sand. In addition to the 10-in. surface casing, the oil wells were completed with a string

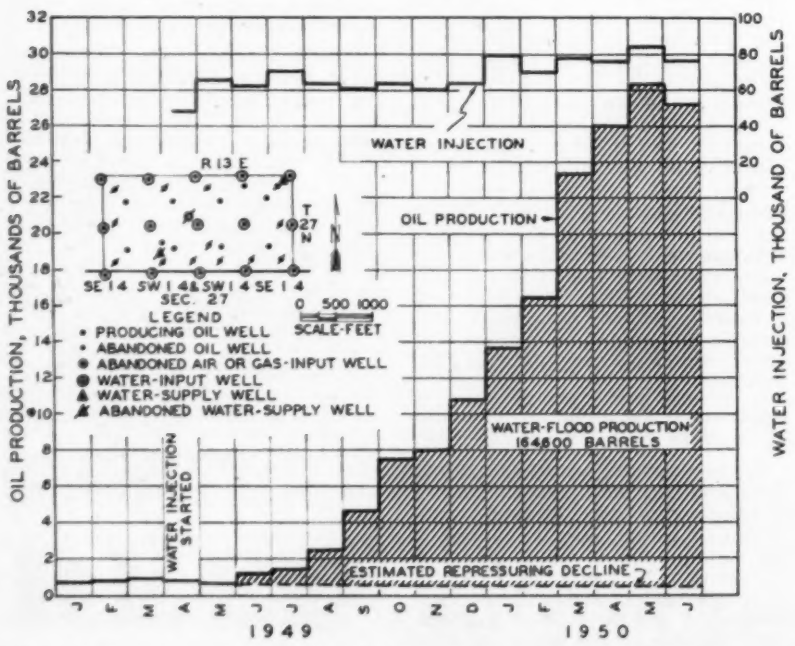

Fig. 4—Production history of Keener Oil & Gas Co. water-flooding project, Weber pool, Washington County, Oklahoma.

*Petroleum engineer, Bureau of Mines.

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The separate and replaceable seat, an innovation in valve design, permits any desired trim for any special service and facilitates repairs without removing the valve from the line. Pressure forces improve the seal between seat and plug and the harmful effects to body distortion are eliminated. The unique design also obviates the need for sealing lubricant, saves the maintenance required by ordinary plug valves and removes a source of product contamination. The lift-turn and reseat mechanism assures easy operation without lubrication.

Anyone interested in valves for petroleum, chemical, oilfield or any industrial service is invited to send for the complete story on this remarkable valve. *Cameron Iron Works, Inc., P. O. Box 1212, Houston, Tex. Export: 74 Trinity Place, New York.*

The unique Plug Actuator which lifts, turns, and reseats the plug in only ¾-turn of the wrench. To provide the larger sizes and higher pressure models with the same ease of operation available in the lower pressure and smaller sizes, a simple spur gear reducer is attached to the directly-actuated mechanism.

Note that the seat is not attached to the valve body but is a separate member. This feature allows the selection of trim materials best suited for the service conditions and permits easy field repair without removing the valve from the line.

Cameron

NON-LUBRICATED LIFT-PLUG VALVES

of 7-in. casing set and cemented in the top of the Bartlesville sand.

Water used for injection is obtained from the Arbuckle group. The water-supply well penetrated the top of the Arbuckle dolomite at a depth of 1,745 ft. and was completed in the Arbuckle at a depth of 2,625 ft. A string of 7-in. casing was set at a depth of 1,750 ft., leaving 875 ft. of open hole in the Arbuckle section.

Capacity of the well was tested during drilling when a depth of 2,004 ft. was reached. This test indicated a productive capacity of approximately 2,000 bbl. of water per day, an amount considered insufficient for the requirements of the project. Subsequently it was deepened and penetrated a white-water sand in the lower part of the Roubidoux formation of the Arbuckle group from 2,479 to 2,510 ft. By means of a Reda pump set at about 500 ft. below the surface, the well is furnishing approximately 4,200 bbl. of water daily.

The water-supply plant uses a closed system in which the water-supply well produces into a 1,600-bbl. wooden supply tank in which an oil seal approximately 18 in. thick on top of the water prevents exposure of the water to the atmosphere. Return water, which is beginning to appear at several wells, is pumped from the gun barrel into the water-supply tank. The water level in the tank is controlled by means of a liquid-level controller on the supply tank that automatically operates the Reda pump in the supply well.

Water is taken from the supply tank by an electrically driven 3 by 7-in. triplex pump and is discharged into a manifold at the plant. The pump is equipped with porcelain-lined plungers to minimize corrosion. Each input well is connected directly to the discharge manifold and each line is equipped at the manifold with a control valve, water meter, and pressure gage for ease in control and measurement of the injected water.

Chemical Treatment

The only chemical treatment of the water is the addition of sodium hexametaphosphate at the supply tank to reduce corrosion and stabilize the dissolved carbonates.

Each of the producing wells is connected directly to a manifold at the tank battery and extra tanks are provided for individual well testing. Cement-lined pipe is used in all water-supply lines and lead lines from the oil wells. All the producing wells are equipped with individual electrically driven pumping units. The pumping units are automatically controlled by electric timers.

Water injection was started in April 1949, when 4,000 to 4,200 bbl. of water daily, or approximately 8 bbl. of water daily per foot of sand was injected into the 15 water-input wells. The production history of the water-flooding project is shown graphically in Fig. 4. The first increase in the rate of oil production as the result of water flooding occurred in June 1949, when oil production for the month

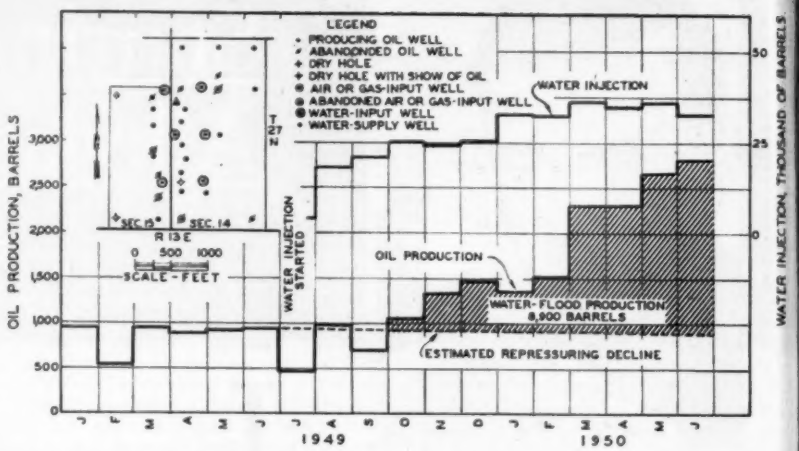


Fig. 5—Production history of Bruce Oil Co. water-flooding project, Weber pool, Washington County, Oklahoma.

TABLE 2—SUMMARY OF OPERATIONS, KEENER OIL & GAS CO., W. R. SHAILER BARTLES FEE PROJECT, WEBER POOL, WASHINGTON COUNTY, OKLAHOMA

Location—27-27n-13e
Sand flooded—Bartlesville
Top of sand—1,235 ft.
Effective sand thickness—27.7 ft.
Productive area—80 acres
Area developed—80 acres
Well pattern—5 spot (660 ft. by 660 ft.)
First injection—April 1949
First increase—June 1949
Status—active
Gravity—37.6° A.P.I.
Formation—temperature 88° F.
Viscosity Saybolt Universal—44.7 seconds at 88° F.

OIL PRODUCTION BY YEARS (BARRELS)

1906	59,097	1915	4,653	1924	5,318	1933	4,383	1942	5,849
1907	64,476	1916	*5,139	1925	4,671	1934	4,219	1943	‡6,833
1908	59,629	1917	7,238	1926	4,186	1935	4,130	1944	6,717
1909	49,612	1918	6,486	1927	†4,069	1936	3,922	1945	6,525
1910	37,500	1919	6,887	1928	5,970	1937	‡3,977	1946	6,647
1911	13,470	1920	6,169	1929	6,987	1938	3,339	1947	6,945
1912	11,692	1921	5,312	1930	6,571	1939	†4,155	1948	9,673
1913	7,961	1922	5,453	1931	6,084	1940	5,851	1949	§40,355
1914	5,518	1923	5,724	1932	4,843	1941	5,675	1950	¶135,215

Production before flooding ..... 503,600 bbl.
Production per acre before flooding ..... 6,295 bbl.
Total production through June 30, 1950 ..... 675,125 bbl.

*Vacuum applied. †Gas injection started. ‡Gas injection discontinued. §Water flooding started. ¶Six months' production.

SUMMARY OF WATER-FLOOD PERFORMANCE

Date—	Acres flooded	Injection wells*	Oil wells	Cum. oil production bbl. per acre	Cumulative water-oil ratio
December 31, 1949	80	15	8	454	16
June 30, 1950	80	15	8	2,144	6

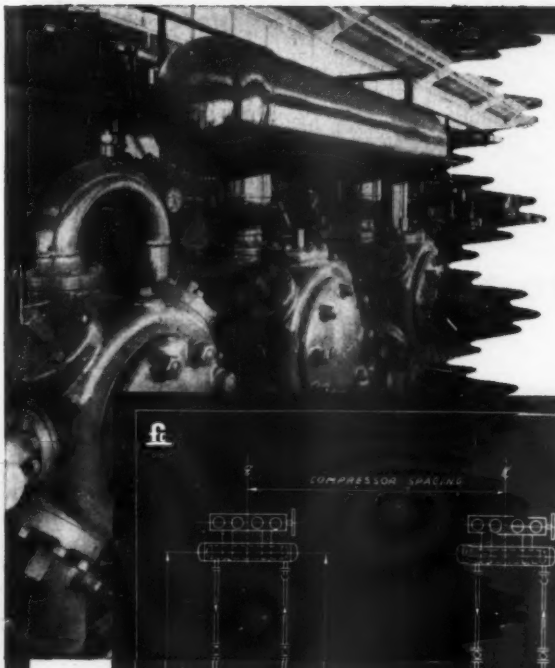
Water injected through June 30, 1950 ..... 1,030,844 bbl.
Oil produced by flooding through June 30, 1950 ..... 171,525 bbl.

*Includes wells owned jointly with Forest Oil Corp. Forest's interest amounts to 5¼ wells.

MONTHLY RECORD OF WATER INJECTED AND OIL PRODUCED

	1949		1950	
	Water injected (bbl.)*	Oil produced (bbl.)	Water injected (bbl.)*	Oil produced (bbl.)
January	.....	.....	79,616	13,664
February	.....	.....	70,672	16,504
March	.....	.....	78,787	23,354
April	48,580	.....	77,200	26,047
May	65,987	.....	84,693	28,427
June	63,305	1,224	76,535	27,219
July	70,915	1,438	.....	.....
August	64,021	2,550	.....	.....
September	61,812	4,678	.....	.....
October	64,296	7,552	.....	.....
November	60,210	8,053	.....	.....
December	64,213	10,815	.....	.....
Total	563,341	36,310	467,503	135,215

*Includes all water injected, except Forest Oil Corp.'s proportionate share injected into jointly owned line wells.



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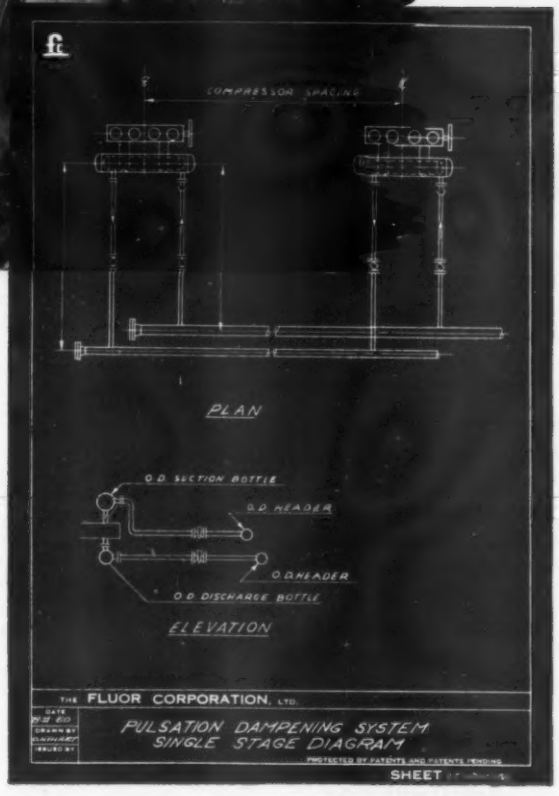

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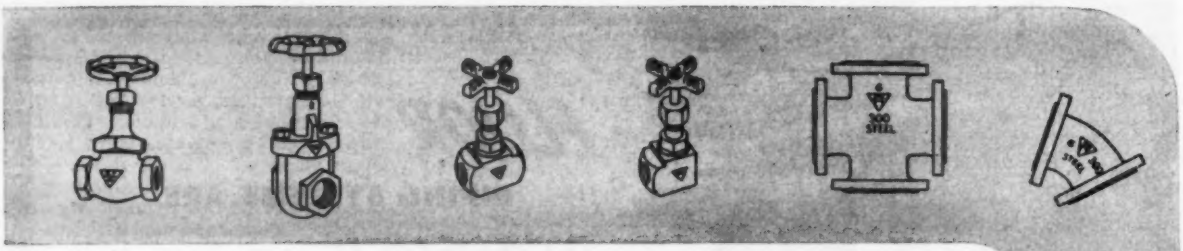

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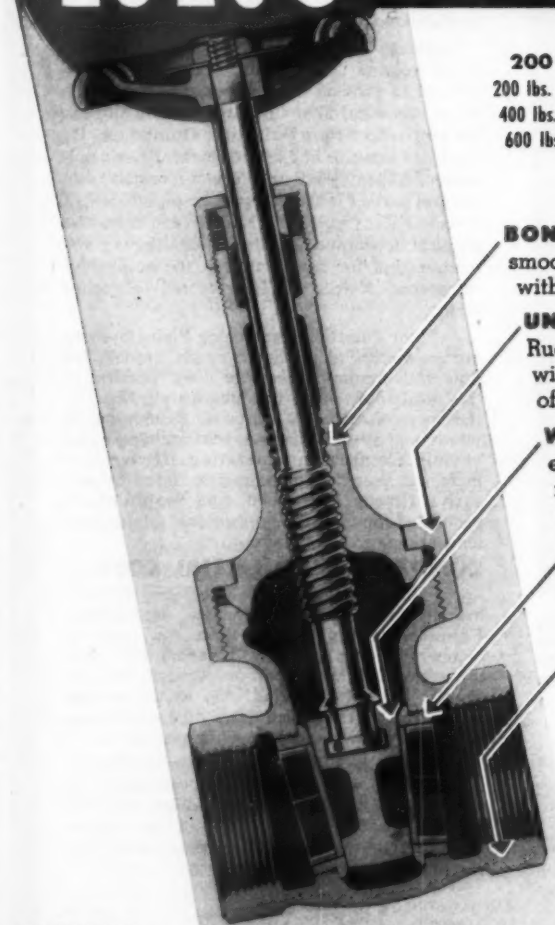

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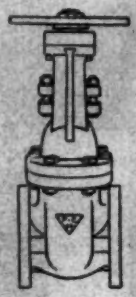

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increased to 1,224 bbl. from the previous average of 700 to 800 bbl. From June 1949 the monthly rate of oil production increased rapidly to 28,427 bbl. in May 1950.

Based upon a normal decline for repressuring operations, it is estimated that approximately 164,600 bbl. of oil, amounting to 2,058 bbl. per acre or 74 bbl. per acre-foot, was gained by water flooding to July 1, 1950. It is interesting to note that the oil gained by water flooding over a period of 13 months exceeds the total production from the lease for the previous 30 years which include the repressuring operations and most of the life of vacuum operations.

The results of the water-flooding operations are summarized in Table 2, including the oil production, by years, from original development in 1906 to June 1950, inclusive, performance data, and volumes of water injected and oil produced monthly from April 1949 to June 1950.

The volumes of water injected monthly, as listed in Table 2 and shown graphically in Fig. 4 represents all the water injected into the 15 input wells less the volume represented by Forest Oil Corp.'s proportionate interest in 10 injection wells (equal to 5¼ wells) along common property lines. The rate of water injection has remained fairly constant, averaging approximately 66,000 bbl. per month.

Bruce Oil Co.—In September 1948 the Oklahoma Corporation Commission granted permission to Bruce Oil Co. to water flood its properties in the northern part of Weber pool, consisting of 280 acres in Sections 14, 15, 22, and 23-27n-13e. Late in 1948 the development of a flood was started on 112 productive acres that previously had been subjected to repressuring. (See Project 1, Fig. 1.) Gas injection was started in 1926 when two old oil wells were converted to gas-input wells.

In January 1931 two other oil wells were converted to gas-input wells and one of the original gas-input wells was abandoned. No effort was made to control or measure the volume of gas injected during the life of the project but all of the gas produced and not needed for lease operation was returned to the producing formation. As no makeup gas or air was added to the recycled medium, the volume of gas available for injection by 1949 was small. Repressuring was discontinued in July 1949, when water injection was started.

It is estimated that approximately 288,000 bbl. of oil, amounting to a recovery of 2,571 bbl. per acre, or 154 bbl. per acre-foot, would have been produced from leases included in this project if secondary-recovery operations had not been used. An additional 267,000 bbl. of oil, equal to 2,384 bbl. per acre, or 143 bbl. per acre-foot, were gained by repressuring.

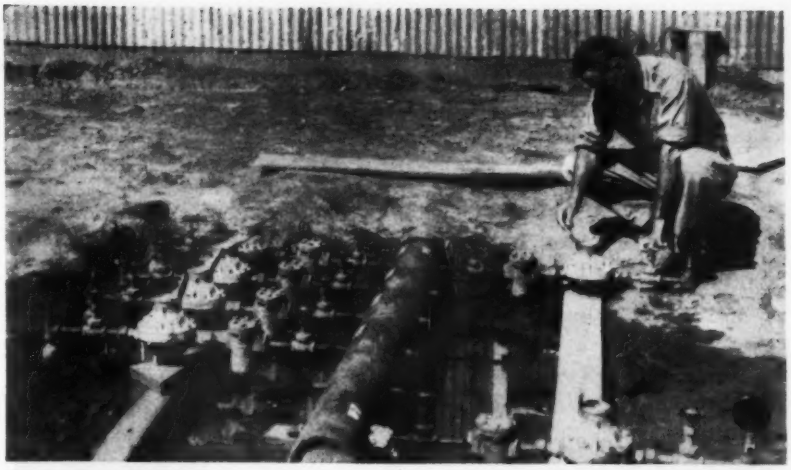


Fig. 6—Water-input well manifold and water pressure plant, Weber pool, Washington County, Oklahoma.

Six new wells were drilled for water injection on an irregular 6⅔-acre five-spot pattern spaced approximately 440 ft. apart in an east-west direction and approximately 660 ft. apart in a north-south direction. The wells

TABLE 3—SUMMARY OF OPERATIONS, BRUCE OIL CO., WEBER UNIT PROJECT, WEBER POOL, WASHINGTON COUNTY, OKLAHOMA

Location—Sections 14 and 15-27n-13e
Sand flooded—Bartlesville
Top of sand—1,200 ft.
Effective sand thickness—15 ft.
Productive area—112 acres
Productive area—35 acres
Well pattern—Irregular
First injection—July 1949
First increase—October 1949
Status—active
Gravity—37.6° A.P.I.
Formation—temperature 88° F.
Viscosity Saybolt Universal—45 seconds at 88° F.

OIL PRODUCTION BY YEARS (BARRELS)
(112 acres)

1907	22,370	1918	*3,232	1929	17,243	1940	8,451
1908	69,422	1919	2,956	1930	14,777	1941	8,533
1909	33,172	1920	†13,689	1931	13,000	1942	8,756
1910	24,788	1921	17,130	1932	12,554	1943	7,054
1911	14,632	1922	12,344	1933	10,831	1944	7,459
1912	11,890	1923	11,864	1934	11,224	1945	6,897
1913	7,178	1924	13,165	1935	12,404	1946	7,152
1914	5,128	1925	12,302	1936	11,635	1947	7,686
1915	3,668	1926	‡13,639	1937	11,989	1948	8,673
1916	3,379	1927	20,207	1938	11,078	1949	§11,148
1917	2,908	1928	19,909	1939	8,958	1950	¶13,132

Production before flooding ..... 552,633 bbl.
Production per acre before flooding ..... 4,934 bbl.
Total production through June 30, 1950 ..... 569,606 bbl.

*Vacuum applied. †12 oil wells completed. ‡Repressuring started. §Water flooding started. ¶Six months' production.

SUMMARY OF WATER-FLOOD PERFORMANCE

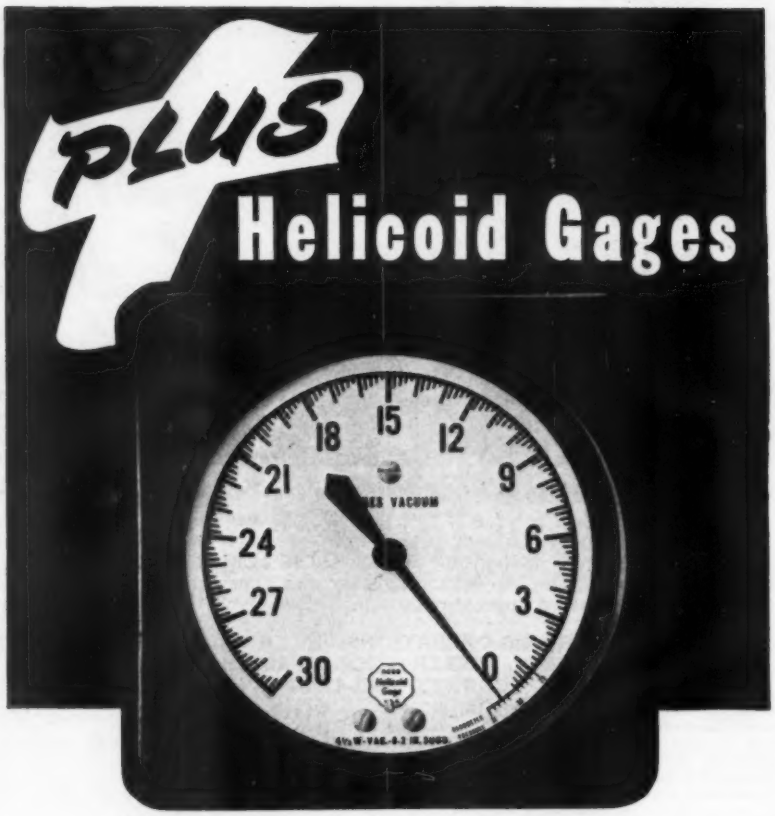
Date—	Acres flooded	Injection wells	Oil wells	Cum. oil production bbl. per acre*	Cumulative water-oil ratio
December 31, 1949	35	6	9	34	31
June 30, 1950	35	6	11	152	19

Water injected through June 30, 1950 ..... 323,146 bbl.
Oil produced during flooding through June 30, 1950 ..... 16,973 bbl.

*Based on 112 acres.

MONTHLY RECORD OF WATER INJECTED AND OIL PRODUCED

	1949		1950	
	Water injected (bbl.)	Oil produced (bbl.)	Water injected (bbl.)	Oil produced (bbl.)
January	.....	.....	32,932	1,352
February	.....	.....	32,508	1,517
March	.....	.....	36,022	2,296
April	.....	.....	34,858	2,300
May	.....	.....	35,997	2,652
June	.....	.....	32,822	3,015
July	4,023	.....	.....	.....
August	18,096	.....	.....	.....
September	20,890	.....	.....	.....
October	25,262	1,047	.....	.....
November	24,196	1,329	.....	.....
December	25,540	1,465	.....	.....
Total	118,007	3,841	205,139	13,132



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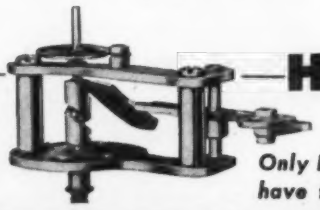

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were cased with 10-in. surface casing to a depth of 20 to 40 ft. and 1½ or 2-in. tubing was set on a packer and cemented at the top of the Bartlesville sand. The old producing wells are used to indicate the progress of the operation, and as the flood progresses they will be plugged and abandoned.

Four new producing wells were drilled to complete the five-spot pattern. These wells were cased with 10-in. surface casing to a depth of 20 to 40 ft., and a string of 7-in. casing was set and cemented at the top of the Bartlesville sand. All the water-input wells and producing wells were shot with nitroglycerin. The development map (Fig. 5) shows the present status of the project.

Water used for flooding is obtained from a well completed in the Arbuckle group at a total depth of 2,513 ft. The well was drilled into the top of the Arbuckle at a depth of 1,803 ft., and 7-in. casing was set and cemented at this point. With 710 ft. of open hole in the Arbuckle formation, the water probably is being produced from both the porous dolomite in the top of the Arbuckle and the Roubidoux sand, which was drilled between 2,445 and 2,494 ft. Tests on this well, with a Reda pump set 520 ft. below the surface, indicate a producing capacity of approximately 4,000 bbl. of water per day.

The water-supply plant uses a closed system in which the water-supply well produces into a 1,600-bbl. wooden supply tank. A float-type liquid-level controller operates the Reda pump to maintain an operating fluid level in the tank. A 6-in. diesel-oil seal on top of the water prevents exposure to atmosphere. The only chemical treatment of the injection water is the addition of Calgon at the water-supply tank to reduce corrosion and to stabilize the carbonates in solution.

Water is injected by an electrically driven 3 by 6-in. horizontal triplex pump equipped with porcelain plungers. Individual water lines to the input wells are equipped with water meters, pressure gages, strainers, and control valves at the manifold in the plant to provide ease of control and measurement of the injection water. Fig. 6 is a photograph of the manifold on the water-distribution system.

The oil-gathering system consists of a 4-in. line with connecting 2-in. laterals to the producing wells. The four new oil wells are equipped with individual electrically driven pumping units, and the old oil wells are pumped by a central power.

The production history of the project to June 30, 1950, is shown graphically in Fig. 5.

The rate of oil production has not reached a peak and therefore the trend of the production-decline curve has not been established.

LET'S DRILL SOME WILDCATS!

Speaking at recent Fort Worth geological-geophysical meeting a leading exploration expert advocates bold action

Ira H. Cram, Houston, vice president in charge of exploration and production, Continental Oil Co., in the opening address of the joint regional exploration meeting at Fort Worth, November 30-December 1, proposed some challenging ideas on wildcatting for the nation's oil finders. Excerpts from Cram's address appear here. (Digests of technical papers dealing with southwestern area basins presented at the Fort Worth meeting appear in this issue, page 101.)

"OIL has never been easy to find except in retrospect. We are plagued by no end of difficulties, including areas of barren traps that are easy to find, or areas of prolific traps that are hard to find. You probably have both kinds of areas among the areas under discussion with the latter type predominating.

"My all too incomplete experience in these areas (southwestern basins) strongly suggests to me that the solution of your oil-finding problems requires superlative geological and geophysical talent—the best, the most skillful, the most ingenious, the most daring, the most imaginative, and the luckiest. Too often in these areas you go through your bag of geological and geophysical tricks—one of the Continental geophysicists calls it his mumbo-jumbo—and you end up with little tangible information.

Objective Is to Drill Wildcats

"The object of all geophysical investigations and most geological work is to find excuses to drill wildcat wells. What evidence do **you** demand before you are willing to drill a wildcat well; in other words, what are **your** specifications? Each one of you has a somewhat different set of specifications—thank heaven—for if we all agreed we would find only a small fraction of the oil we find by disagreeing.

"The normal methods of geological and geophysical investigation will furnish a certain number of anomalies that most of you will be willing to drill. However, to repeat, in a large part of the areas under discussion the results are not very revealing so that the specifications of too many of you are infrequently met.

"In such a situation, you perhaps conclude that either you wait for a new tool, or you let the Dad Joiners do it, or you revise your specifications. Admittedly, a new tool would be something lovely to behold, but we cannot wait for something that may never be invented. We cannot wait for the Dad Joiners either, and furthermore, it is unthinkable that the maturing profession of petroleum geology should decide on such buck passing.

High Demand Requires Action

"You will note I seem to be in a hurry—at least I say we cannot wait—and, gentlemen, we cannot wait. You must be aware that today we are producing twice as much oil as we did 20 years ago, and that petroleum economists only argue as to how much **more** we are going to have to produce next year, the next 5 years, and so on.

"In order to bring the problem closer to home let us assume your company produced 1 per cent of the nation's production in 1929 — 1 per cent of 1 billion barrels is 10 million barrels. Remembering that it was supposed to be easier to find oil in those olden days, you now must find and develop enough reserves to provide 20 million barrels of production per year if your company is simply to maintain its position as a producer of 1 per cent of the nation's production. The relentless hunger of our country for petroleum products simply will not permit us to depend upon possible new inventions and random drilling as important methods of discovery...

Must Change Specifications for Wildcats

"The conclusion, I think, is obvious—you must change your specifications for excuses to drill if you are to explore more adequately large portions of your areas with your present kit of tools. The change in specifications I have in mind is not new; and it is not simply the lowering of requirements so that every wiggle on your geological and geophysical maps becomes a drillable prospect.

"The change I have in mind is more fundamental and involves the drilling of more wildcat wells on more imaginative prospects. A given set of facts becomes a prospect worth drilling in the hands of an imaginative explorer. The first well may be dry as a bone, but may point the way to the second which in turn may blaze a trail to the third wildcat and a discovery. The same set of facts in the hands of an unimaginative explorer is just something to fill the already bulging and insufficiently used files.

"Who is most capable of guessing the answer to a question involving the earth? There can be only one answer—the geologist. But, it is no game for the timid soul or the security-minded individual. It's a pretty big poker game, and as the price of poker goes up, only the topnotch players stay in the game.

Program Must Be Large

"Speaking of the price of poker, the imaginative wildcats I have been talking about will cost a lot of money. Without much question I am recommending spending more money on exploration, but perhaps not as much more as the cost of the imaginative wildcats. Some of these ventures might well be financed by the money that otherwise would be spent, for instance, on second or third-rate geophysics as measured by results. After all, the total cost of the wildcat venture including drilling is "X" dollars, and it is up to the geologist to get the most information, and ultimately oil, per dollar spent. When he gets drilling minded, he may well, on occasion, get the most for his money by drilling more wildcats at the expense of geophysics or core drilling.

"Can the industry afford such a program of exploratory drilling? The answer is clear to me—the industry **must** afford it. Let me explain.

"In the areas under discussion at this meeting it will take a great many wildcat wells ranging in caliber from the most orthodox to the most imaginative to discover the oil and gas pools that exist in these areas. Other areas in the United States require wildcatting on a similar scale. There is every chance that the results of such drilling will supply the nation with important, if not adequate, quantities of crude oil and gas as long as these substances are popular sources of energy.

"It simply boils down to this—if we are to be reasonably supplied with our own oil we'll have to do a lot of imaginative drilling. Furthermore, if we are to be so supplied—and who of sound mind would argue against it in this unsettled world—yes, if we are to be so supplied, the economic and political climate must be such

XUM

that the petroleum industry **can** afford the necessary expenditures.

"Having stated that the industry must afford the imaginative wildcatting campaign, you, of course, would like to know how much it will cost. How many cents per barrel will it add to the finding cost? You can be sure that I do not know the answer to that question. I can only repeat that whatever the cost is, we have to afford it.

"My personal view is that the cost will not be excessive, for I have every confidence—and history to date substantiates my view—that the petroleum industry led by a host of imaginative business men and scientists will contrive to get the job done, barring outside interference. I should not have used such insipid terms as 'outside interference,' for you know I mean governmental interference.

Maybe Raise Depletion Allowance.

"Any and all laws and regulations that provide incentives to the petroleum industry must be maintained and strengthened. The abolition or whittling down of percentage depletion would be—to be insipid—exceedingly detrimental to the oil-finding effort. As more expensive means of exploration become necessary, the depletion allowance will probably have to be raised rather than lowered. Also, the expensing of intangible development costs cannot be done away with without immeasurable harm.

Exploration Must Be Uninterrupted

"Experience demonstrates that the results of our efforts to find and develop oil fields are best when the efforts are uninterrupted over a period of time. Exploration is not the sort of operation that can be turned on and off at a moment's notice. This is true whether one is considering the operation of the industry as a whole or just the operation of a single company. It is true of any complicated operation, and exploration is a most complicated operation. It is not just a question of manpower and organization alone. An array of talent ranging in caliber from common laborers to highly trained scientists must be welded into a fighting force or team if results worth the expenditures are to be obtained.

Reserves Grow With Exploration Efforts

"Consider some interesting statistics. On December 31, 1929, the nation's proved crude oil reserve was reported to be 13.2 billion barrels. Seven years later on December 31, 1936, the reserve was reported to be 13.06 billion barrels, a decrease during a period of low consumption. You, of course, recognize the period as the great depression, and many of you have all too vivid memories of the wrecking of the industry's exploratory machine in this period.

"Around the middle of the period the industry started to build the exploratory team again, and as it gained momentum the discoveries started to roll in. Even though consumption increased, crude reserves when Pearl Harbor occurred were 19.59 billion barrels, an increase of over 6 billion barrels in 5 years.

"During the next 5 years, reserves increased only approximately 1¼ billion barrels as exploration received another body blow during the war. After the war, the exploratory machine gained momentum and both production and reserves increased almost 4 billion barrels over the next 3 years, so that on December 31, 1949, proved reserves of crude were reported to be 24.6 billion barrels.

Full Competition Vs. One Company

"We only find an adequate supply of crude oil and gas because the many industry units hunting oil and gas are free to spend their own hard cash on their own ideas in one of the most highly competitive fields known to man. If the number of competing units were drastically decreased, available crude supplies would inevitably decrease.

"Can you not imagine how little oil the one and only company would find even if it were privately owned? That company would really conserve the nation's reserves of hydrocarbons by leaving them in the ground undiscovered. I guess **preserve** is the word.

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2. Lower multiplication factor in 20 kc transmitters means substantial reduction of spurious radiations.
3. Signal-to-noise ratio differences in high signal level areas are insignificant.

• You'll find more true, high-selectivity General Electric 20 kc units in service than all other makes combined. And G. E. also manufactures high-performance units for expansion of present systems where continued operation on a 40 kc channel basis is desired.

Instant communication for wide-area operations is our specialty. There's a radio communication representative at the G-E office near you. Ask him for full details. Meanwhile, write for some interesting new literature on microwave equipment: General Electric Company, Section 8120-14, Electronics Park, Syracuse, New York.

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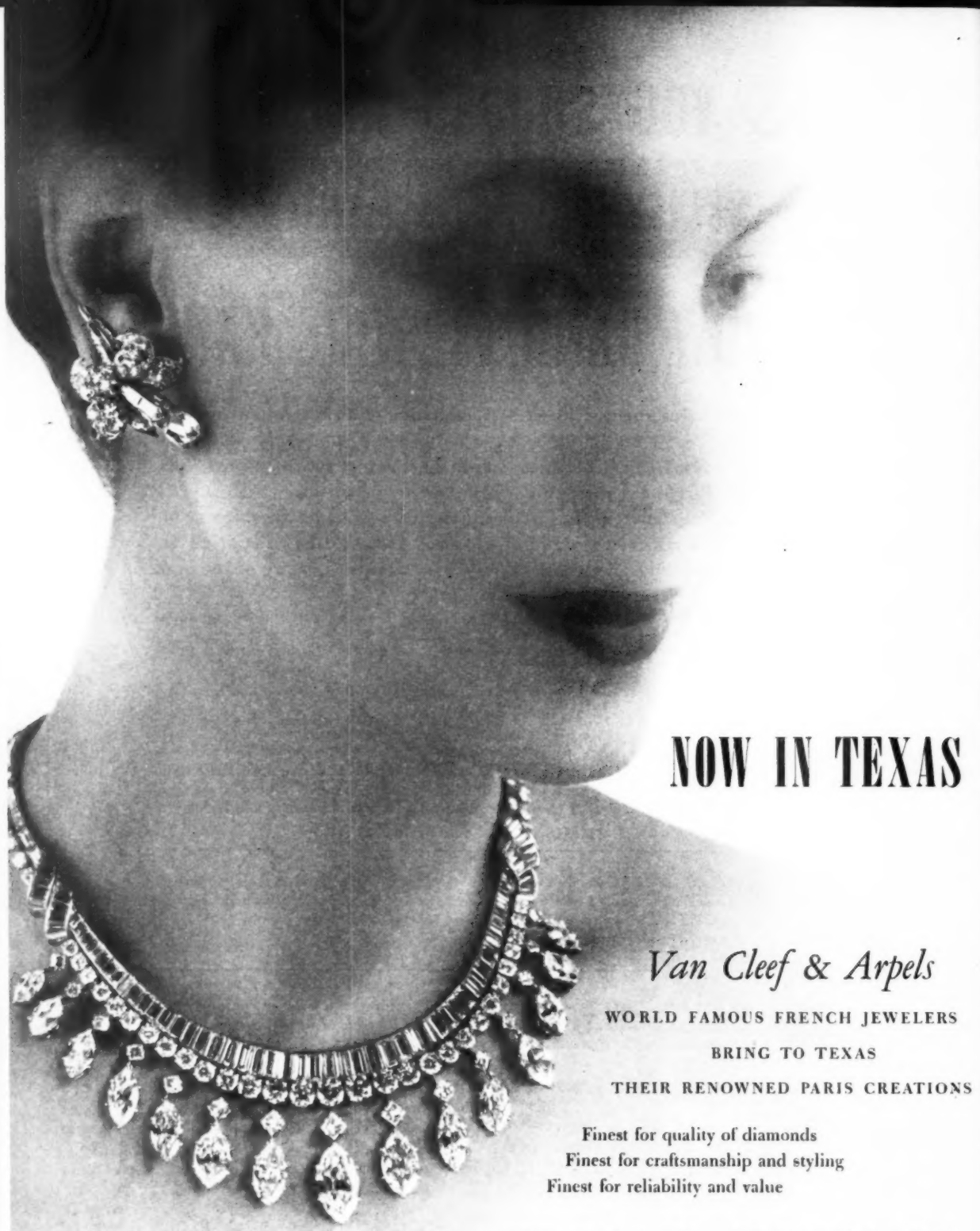

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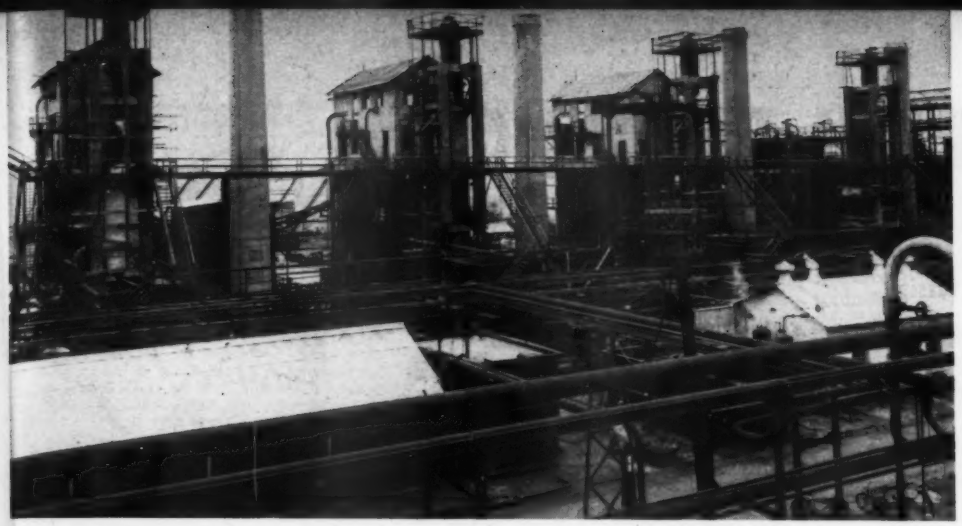


A general view of Batteries 53 to 56, Holmes-Manley cracking units which The Texas Co. installed at Port Arthur in 1925. Into these units went the first fusion-welded pressure vessels ever fabricated. Some of them are still in service.

First Electric-Welded High-Pressure Vessels Ever Fabricated Complete 25 Years of Refining Service

THE petroleum industry recently marked the twenty-fifth anniversary of a significant development in refining equipment. In the fall of 1925 the first electric-welded high-pressure vessels ever fabricated were placed in operation by The Texas Co. at its Port Arthur refinery. Comprising 24 key vessels in 4 new Holmes-Manley cracking units, they represented an important contribution to the progress of cracking technology of that period, and to high-pressure processing generally.

Following World War I, petroleum refiners throughout this country were engaged in increasing the yield of gasoline and improving its anti-knock quality by the application of newly developed thermal cracking processes. The high pressures and elevated temperatures required in many such processes posed a serious problem in adapting thermal cracking to successful commercial operation.

An outstanding solution to this problem was demonstrated by The Texas Co. and A. O. Smith Corp. by their joint efforts in first adapting the use of strong ductile welds in building refinery pressure vessels.

Initial agreement on the new project was reached by the two companies in early 1925, and the following vessels were ordered from A. O. Smith's Milwaukee plant:

Sixteen soaking drums, 5 ft i.d. by 41 ft. ¾ in., with 2½-in. walls,

Four bubble towers, 6 ft i.d. by 43 ft. 4¾ in., with 2-in. walls,

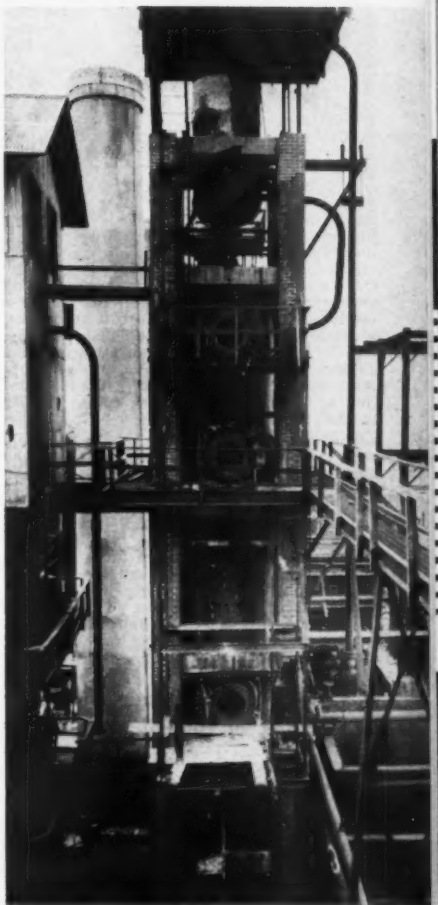
Four reflux exchangers, 4 ft. i.d. by 10 ft. 3 in., with 1¼-in. walls.

The vessels were fabricated by the slab method. Since rolling facilities for units of such size and weight had not yet been developed, longitudinal segments of the heavy vessels were pressed into shape using huge dies. The preformed sections were then joined by metallic arc welding, employing coated electrodes developed by A. O. Smith in the manufacture of small aerial bombs during World War I.

In the autumn of the same year the vessels were incorporated into The Texas Co.'s four new Holmes-Manley units, designated as Batteries 53 to 56. They performed with complete satisfaction and some of the original vessels still remain, performing important thermal cracking to supplement catalytic cracking in the 190,000-bbl. per day refinery.

The four Holmes-Manley units with the newly designed vessels were installed during a period which saw widespread acceptance of that thermal cracking process. The process was first adapted commercially at Port Arthur in 1920. The advent of the new fusion welding technique for fabricating high-pressure vessels aided in the further application of the process and by 1928 there were over 150 Holmes-Manley units—a total of 900 vessels—in operation throughout the industry.

As one of the first continuous cracking processes, the Holmes-Manley process originally employed a coil heater for preheating charge stock, four soaking drums or reaction vessels operating in series, and a fractionating tower separating light cracked products from the heavier gas oils which were recycled to the preheater furnace. Furnace outlet temperatures ranged from 800° to 875° F. and the soaking vessels, bubble tower, and reflux exchanger are operated at pressures ranging from 300 to 400 psig. These conditions still hold for some of the vessels installed a quarter of a century ago, as permitted by the safety limitations allowing for the corrosion resulting from 25 years of operation.



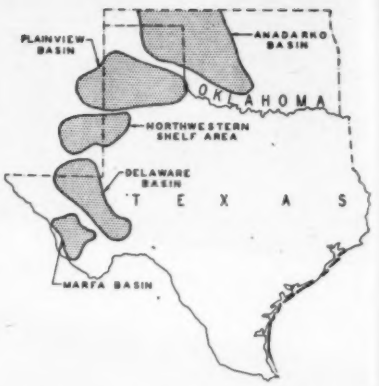
This bubble tower topped by a reflux condenser is still in use after 25 years' operation. Since its original installation, the vessel was refabricated in place by new welding. The photograph was taken recently when Battery 53 was partially dismantled for test and inspection.

XUM

FUTURE OIL PROVINCES

—Southwestern United States

Digests of geological and geophysical papers presented at regional exploration meeting, Fort Worth, November 30-December 1.



Delaware Basin

Geology of Delaware Basin

BERTE R. HAIGH, University Lands, Geological Division, Midland, Tex.

THE Delaware basin of West Texas and southeastern New Mexico is truly a geological basin, being somewhat kidney shaped in appearance, with an areal extent of approximately 11,000 sq. miles. The major axis of this kidney-shaped basin is some 150 miles in length and extends from the buried portion of the Capitan reef in southern Eddy County, New Mexico, southeastward to the Glass Mountains in southern Pecos County, Texas. The minor axis is about 65 miles in length and extends from the western edge of the Central Basin platform in Ward and Winkler counties of Texas westward to the eastern slope of the Delaware Mountains in Culberson County, Texas. It is traversed from northwest to southeast by the Pecos River and the deepest portion of the basin lies between the Pecos River and the Central Basin platform. Differences in surface elevation over the major portion of the basin are relatively small.

Although there are a few known, and probably a few undiscovered, areas of folding along the southwestern and western portion of the perimeter, by far the greater portion of the basin is noted for, so far as is known to date, a complete lack of anticlinal features. All of the productive areas discovered to date are of a terrace nature, being located either on the long eastward dipping monocline or on the shorter, sharper eastward upslope to the Central Basin platform. Very slight, if any reversals in dip have been found in these productive areas. All commercial production to date is from either the base of the Lamar limestone (upper member of the Delaware series) or the top of the Delaware sand, probably from lenses of coarse sand that are located at the base of the Lamar in the terrace areas.

The "basin fill" portion of the geologic column over the major portion of the basin area is quite thick, reaching a maximum of 1,700 ft. in the trough portion of the basin. The evaporite portion which constitutes the balance of the section above the Delaware series reaches a thickness of 3,200 ft. in the deeper basin area.

There are no mappable surface units in the basin area, except along the southern and western portions of the perimeter and there is no noticeable relationship between surface topography and the producing oil structures.

Review of Seismic and Gravity Exploration of Delaware Basin

W. A. McFADDEN, JR., Standard Oil Co. of Texas, Midland, Tex.

LIMITED application of reflection seismic method has been made. There has been no known success except in areas of locally favorable surface conditions. There is no known subsurface reason for the general failure to record reflection energy.

Extensive refraction seismic surveys have been made in the Delaware basin. Refraction energy has definitely been recorded but evaluation of resulting structure maps has been difficult because of lack of subsurface and seismic velocity control. Problems imposed by surface and subsurface conditions are discussed.

Extensive gravity surveys have been made. Evaluation of gravity data is difficult because of the lack of control. No detailed correspondence of the gravity information with subsurface or seismic data can yet be established.

Evaluation of Magnetics in Delaware Basin

H. WAYNE HOYLMAN, consultant, Los Angeles.

THIS paper points out the requirements necessary to make reliable ground and airborne magnetic surveys. Undesirable qualities of the ground survey in the Delaware basin were compared with the reliable airborne survey.

Anomalies associated with certain of the larger oil fields, Drinkard, Hobbs, etc., are discussed, as indicative of magnetic conditions anticipated in the Delaware basin. Additional slides show some general types of anomalies that occur in the Delaware basin along with derivative pictures for purposes of interpretation.

From the large number of correlations between anomalies and Ellenburger structure, on the platform, and around perimeter of the basin, it is obvious that, percentagewise, anomalies are very favorable reflections of basement topography that are overlain by structure in the lower Paleozoics.

Anadarko Basin

Geology of Anadarko Basin

R. V. WARD, Shell Oil Co., Oklahoma City.

RECENT exploratory activity in the Oklahoma portion of the Anadarko basin has resulted in drilling of several deep wildcat tests. Majority of the wells have been drilled along a northwest-southeast trend from Elk City field and northwestward from Ringwood field. However, other significant tests have been drilled elsewhere in the basin. Data from these wells have contributed towards a more complete analysis of the basin although many structural and stratigraphic problems remain unanswered.

This paper deals with a generalized discussion of the stratigraphy, structure, areal distribution of important rock groups, presently known types of producing traps, and related topics.

Geophysics of Anadarko Basin

PAUL L. LYONS, Carter Oil Co., Tulsa.

OIL and gas development of the Anadarko basin has progressed slowly because of poor seismic results obtained in much of the basin area. Necessity for widespread use of "phantom" seismic horizons, complexity of the mountain-front structures, and apparent simplicity of the basin structure have combined with the great depths involved to retard drilling. Certain relationships and certain structural anomalies are indicated by gravity and magnetic maps available. No marked successes by electrical or geophysical methods have been reported, and electrical and radioactivity logs are somewhat difficult to interpret.

Marfa Basin

Geology of Marfa Basin

RONALD K. DeFORD, University of Texas, Department of Geology, Austin.

FROM the Cambrian to the Jurassic the Marfa, Delaware, and Midland basins had similar histories. The Marfa basin may contain Ordovician, Silurian, and Devonian rocks, and the lithofacies may be the same as where these systems are productive. Mississippian may be present. The Pennsylvanian and Permian are represented by a thick marine sequence extending from Strawn to Guadalupe at least.

The Cretaceous system ranges in thickness from a few hundred feet of limestone on the north to many hundreds of feet of limestone, shale, and sandstone on the south.

Its violent post-Cretaceous history distinguishes the Marfa basin from those parts of the Permian basin now producing petroleum. Does this mean that earlier accumulations have been dissipated?

Geophysical Evaluation of Marfa Basin

J. H. WILSON, Independent Exploration Co., Fort Worth.

THIS paper gives information on past geophysical investigations and the special problems that are involved in the application of various geophysical methods were discussed.

Plainview Basin

Paleogeology of Plainview Basin

ROBERT ROTH, Humble Oil & Refining Co., Wichita Falls, Tex.

THE area bounded by the Amarillo axis on the northeast, the Matador Archipelago on the south, and the Pedernal land mass on the west has been described as the Plainview basin.* This area includes all or part of 19 counties in the Texas panhandle and 9 counties in New Mexico.

The basement complex and its structure was described as a background or stage setting for the sedimentary sequence. The areal distribution of each important group or series, their lithofacies, and their source areas was indicated. The importance of depositional environments was stressed.

Finally, areas which have produced commercial petroleum were described.

*Roth, Robert, (1949) Paleogeology of the Panhandle of Texas, Geol. Soc. Am. Bull., Vol. 60, pp. 1671-1688.

Geophysics of Plainview Basin

W. P. HARVEY, Geophysical Service, Inc., Dallas.

A SUMMATION of various geophysical methods employed in Plainview basin for oil exploration is presented along with an evaluation of the relative importance of each method. Special problems encountered in working this region are discussed including changes in technique necessitated by "cap rock" or "gullied" topography. The interpretive problems which confront the seismologist in this area are exemplified in conjunction with illustrative examples of types of structures which geophysical methods have been successful in locating or delineating in this basin.

Northwestern Shelf Area

Geology of Northwestern Shelf Area

W. A. WALDSCHMIDT, Argo Oil Corp., Midland, Tex., and L. T. BROWN, Pure Oil Co., Midland, Tex.

THIS paper reviews, largely by means of cross-sections, general geological aspects of what has been designated as the Northwestern Shelf area. This includes the area from Roswell, N. M., on the west to Texas on the east and from the Matador ridge on the north to the Carlsbad shelf on the south. All but the southernmost section cross the Bagley-Hightower area. The geological formations shown on the cross-sections include those from the San Andres (Permian) to the pre-Cambrian. Of special interest is that from the Devonian production at Baley-Hightower, which is in the center of the area, it is from 25 to 35 miles to other Devonian production in west, northwest, northeast, east, and southeast directions.

Transport in Venezuelan Operations

(Continued from page 79)

some of the major items covered in the program are as follows:

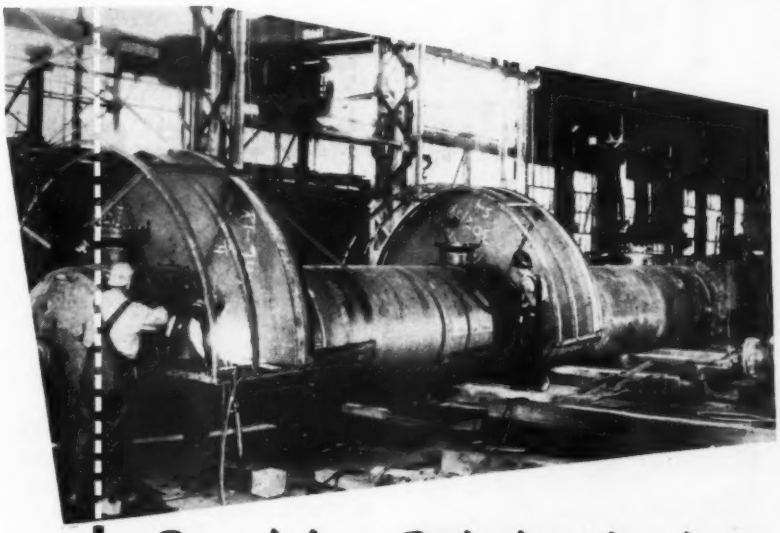
1. Transport policies, office routine, and procedures.
2. Labor law and work contracts.
3. Principles of safety as applied to transport work.
4. Traffic law and regulations.
5. Basics of supervision.
6. Transport problems and relationships between transport section and other sections of the company.
7. Instruction in driving and handling of all types of transport equipment.
8. Basic knowledge of automotive mechanics with special emphasis on diagnosis, simple road repairs, tire care, maintenance, rotation, and matching.
9. Elementary principles of road construction and maintenance.
10. On-the-job training through supervising of oil-field transport operations under the guidance of a Transport Foreman I.

In addition to the planned training programs the company continuously supplies the field transport and maintanence men with the latest information on current trends in the mechanical or transport field, through service bulletins, articles from automotive magazines, etc., and have found this to be of great assistance in keeping the standard of all field work up to par.

Investment and Operating Costs

During the past 5 years the size of Socony-Vacuum's fleet has fluctuated between 390 and 740 units, the present total, aforementioned, being 531 vehicles. During this period the company's average yearly capital expenditures for replacements and additions to the fleet has approximated $467,500. The present investment in automotive transport and road building equipment is approximately $2,300,000. The present rate of expenditure is around $1,500,000 annually in direct out-of-pocket expense in maintaining and operating the motor-vehicle fleet. This represents 65.2 per cent of the total investment. Over and above this approximately $300,000 is spent annually in hired transport, i.e., long-distance cargo hauling and personnel transportation.

It will be seen from the foregoing that operating costs in Venezuela are



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extremely high. The reasons are many, not the least of which are the salaries, wages, and perquisites paid and the high landed cost of equipment, spares, and supplies. Therefore, a very important function of the transport section and one of its major problems is the efficient administration and control of these expenditures, consistent with the best possible operating practices and procedures. Some of the methods found to be most effective in keeping expenses at a minimum are as follows:

1. Adequate experienced field supervision.—A recent study made of transport operations for the past 5 years reveals that as supervision was increased it was possible to reduce working forces in both land transport and maintenance operations as well as accomplish more with less equipment. (See Fig. 4.)

2. Control of productive time vs. output.—Transport and garage foremen are required to maintain detailed daily time sheets for all personnel together with work performed, special attention being paid to time worked on nonessential jobs, which are considered nonproductive. This information is used by transport superintendents as a yardstick in controlling proper staffing.

3. Control of overtime.—Generally speaking, it has been found that most overtime is due to the difficulties encountered by all operating sections in respect to advance planning. This overtime, if not watched closely, can appreciably increase payroll. Therefore, daily overtime reports are carefully perused by transport foremen and superintendents in order that they may be in a position to discuss with other sections closer coordination of their requirements.

4. Well-planned safety and training programs.—Safety instruction has reduced the number of lost-time accidents among both land transport and maintenance shop personnel. Training has increased efficiency and boosted output all along the line. (See Fig. 5.)

5. Equipment utilization. — Daily records are kept from which monthly reports are prepared by division transport superintendent's offices covering all units comprising the transport fleet, which reveal the status and output of all vehicles.

6. Use of hired transport. — Hired transport, both for cargo hauling and personnel transportation, i.e., tour changes, etc., is available and is used wherever economically possible.

Cost of operating all maintenance and service facilities, as well as operating supplies, sectional supervision, etc., are charged to the transport fleet. The resulting fleet expense is prorated by means of hourly rates to those sections using transportation. Individual unit costs are not kept, all costs being accumulated on a group basis, e.g., one group encompasses sedans, coupes, station wagons, and light pickups; another group light trucks of all classes in the 1½ to 5-ton category, and so on. The accounting department issues each month cost statements for each of the groups showing the expense incurred monthly and to date, broken down among the elements of direct cost, distributed cost, and book charges.

While the system is not as satisfactory, from the transport section point of view, as would be an individual unit cost system, sufficient information is supplied on which to base general cost studies. To augment the above the transport section maintains a simple file system in which is accumulated all garage inspection reports, work sheets, and corresponding time records, as well as all spare-parts issue slips for each unit. This enables it to make periodical unit studies for the purpose of comparing costs and determining replacement schedules.

General

The majority of rig moves are accomplished by skidding and, at times, the company is required to move rigs by this method for some distance. The following table covers the period January 1 to September 30, 1950:

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PETROLEUM SERVICE DIVISION

Number of rigs skidded	64
Approximate weight of derrick and substructure per rig skid, tons	100
Maximum distance skidded, miles	17.4
Minimum distance skidded, yards	656
Average length of rig skid, miles	1.9
Total weight skidded, tons	6,400
Total distance skidded, miles	119.3

Formerly Socony-Vacuum derricks were fitted with wooden runners; these, however, took a beating on long skids and required frequent replacement. Today the majority of derricks are equipped with steel runners. Rigs are prepared for moving by the drilling section, blocks are lowered to the floor, anchored, and a strain is taken. The transport section then removes from the floor the rotary table and draw works. Skidding is accomplished by two 20-ton trucks and two to four crawler-type tractors, depending upon terrain and weather conditions. The trucks are spotted in position and the derrick is raised at one end and a number of inches from the ground by the truck winches in order to prevent digging in; the tractors are attached to the front ends of the trucks for pulling purposes. The drilling engines, substructures, pumps, etc., are moved on a specially designed low-boy wagon which is pulled by a tractor. The boilers, pipe, and remainder of equipment are moved on appropriate trucks and trailers. All equipment is unitized and moves are effected in a minimum amount of time.

Socony-Vacuum, among other oil companies operating in Venezuela, provides free transport in suitable buses to all workers who live more than 2 km. from work centers. In this type of service, in Eastern Venezuela, the company operates a fleet of seven semifloat 50-60-passenger buses as well as seven conventional school-type buses and the daily volume of passengers handled is approximately 500.

Drilling rigs, flow stations, water stations, power plants, watchman service, etc., work around the clock and shift changes occur three times during the 24-hour period. The transportation of these workers is handled through contractors. However, company supervision is required since schedules must be set up and coordinated, periodic checks must be made to ascertain that this equipment meets the general appearance, safety, and mechanical standards of the company, as well as complying with local and federal traffic laws and regulations.

The C-47 airplane operated by the company is primarily engaged in servicing exploration parties and/or wildcat-well operations, which are more or less isolated, especially during the rainy season. A regular weekly service is maintained between the two main areas of operation in the eastern and western sections of the country and Caracas for the purpose of transporting materials, supplies, and company business passengers.

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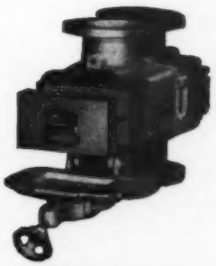

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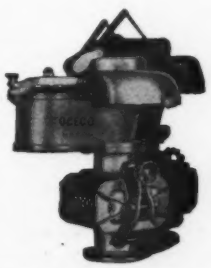
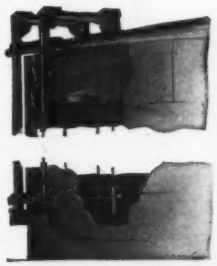


TYPE "BE" VENT UNITS consist of a V-113 Vent Valve with snuffer, mounted on a Type "E" "Extensible" Bank Flame Arrestor. 2" to 10" sizes. Unsurpassed for efficiency and reliability.



LIQUID LEVEL INDICATORS AND GAUGES — wide variety of types for roof or on the ground readings of cone, umbrella, floating, or expansion roof and spheroid tanks. Pressures ranging from 0 to 125 lbs. per sq. in.

V-108 EMERGENCY PRESSURE RELIEF VENTS provide instant relief for excessive internal pressures, resulting from exposure fires, etc. Furnished in 6", 8", 10", 15¼" and 20½" sizes.

WATER DRAW-OFF VALVES for drawing water from the bottom of storage tanks. Unique double valve construction permits the valve chamber to be drained to prevent freezing, and the working valve serviced without emptying tank. 2"x1½"; 3" x 2" and 4" x 3" sizes.

V-114 INTERNAL TANK VALVES are provided with a fusible link that melts when subjected to fire, closing the valve instantly, and cutting off the flow. 3", 4", 6", 8", 10", 12" and 16" sizes.

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STAINLESS STEEL CASTING

ELEVEN ACRES OF FOUNDRY FACILITIES

The above 24,000 pound 18% chromium and 8% nickel stainless steel hydraulic turbine runner casting was recently produced in the Newport News foundries for the Hoover Power Plant in Nevada.

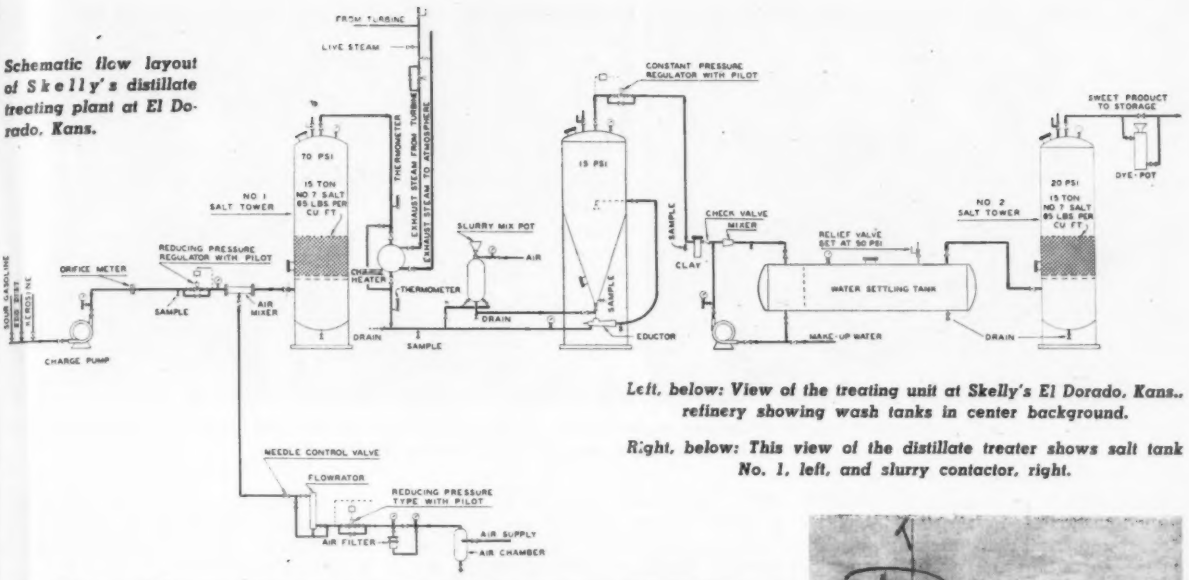
Eleven acres of foundry facilities including modern sand handling, mold making and melting equipment, are available for producing castings. In addition to metallurgical laboratory facilities for physical and chemical analysis, Newport News is equipped with Gamma-Ray, Radiograph and Magnaflux equipment to assure thorough inspection of foundry products.

Your inquiries for stainless steel, iron, steel and brass castings will receive prompt attention.

NEWPORT NEWS

Shipbuilding and Drydock Company

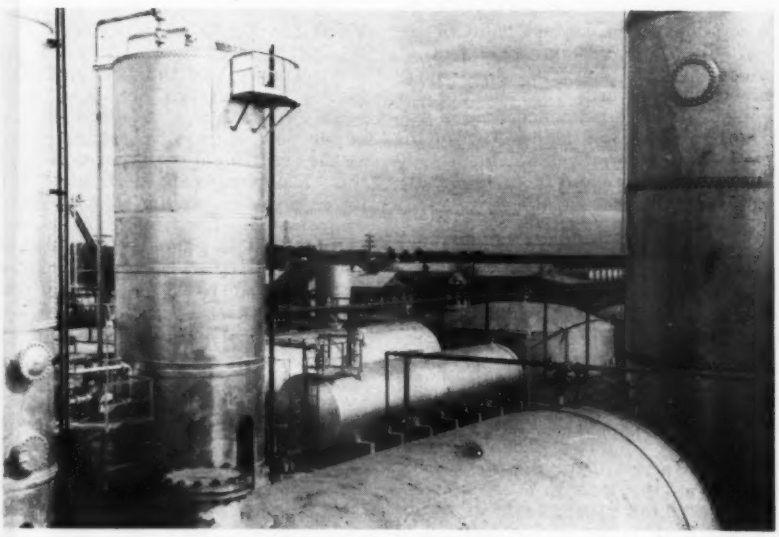
Newport News, Virginia

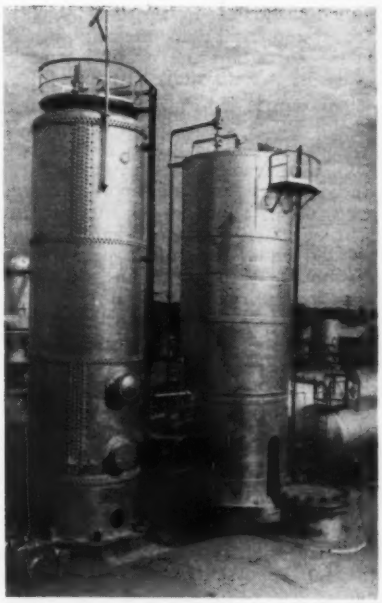


Schematic flow layout of Skelly's distillate treating plant at El Dorado, Kans.

Left, below: View of the treating unit at Skelly's El Dorado, Kans., refinery showing wash tanks in center background.

Right, below: This view of the distillate treater shows salt tank No. 1, left, and slurry contactor, right.





Skelly Oil Successfully Treats 600° E.P. Distillate With Cupric Chloride Slurry

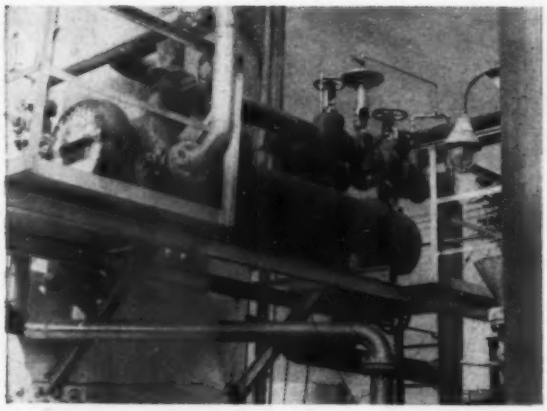
A SIGNIFICANT application of copper sweetening has been made in the El Dorado, Kans., refinery of Skelly Oil Co. The Perco slurry-treating plant, originally designed and built for the express purpose of treating sour gasoline, is currently being used with alternate charges of kerosine and 600° F. end-point distillate.

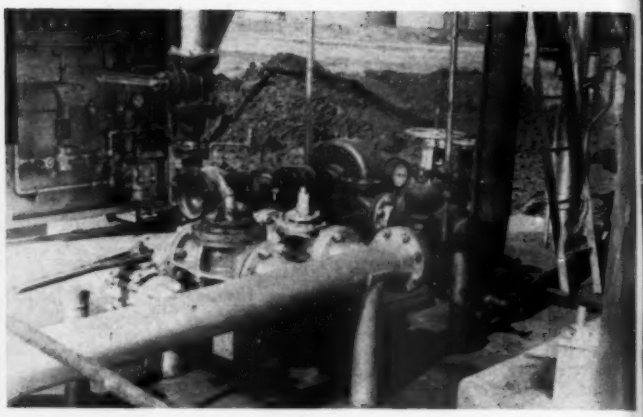
The plant is extremely compact, requiring only four pressure vessels. Operating difficulties are reduced to a point where the attendant merely observes flow and liquid levels.

Material to be treated is delivered to the unit through a manifold on the suction of a turbine-driven centrifugal pump which discharges through a 4-in. transfer line equipped with orifice meter and a pilot-operated pressure controller. Material is released into a 10-ft. by 31-ft. 8-in. vertical vessel containing 15 tons of No. 7 rock salt weighing 65 lb. per cu. ft. The salt bed is supported on a perforated plate approximately 5 ft. from the bottom of the column. Salt is employed instead of gravel because of its affinity for water. Minute droplets of water are coalesced, affording a completely dry product, so that subsequent operations can be performed and controlled accurately. The tower is fitted with a large bolted manhole in its top head surrounded by a platform and guard rails which aid workmen in replenishing the salt with the assistance of a hoist attached to a swinging davit crane.

The moisture-free distillate is transferred from the top of the salt tower through a 4-in. line to a steam-heated exchanger where temperature of the distillate is increased to an average of 25° F. above its initial temperature. Heat is supplied to the shell-and-tube exchanger with the exhaust from the centrifugal charge pump turbine. Under average conditions, adequate heating is obtained with this exhaust steam but in certain cases outside steam may be necessary. To provide additional heat an insulated 1-in. line carries live steam to the exchanger. Indicating industrial-type

XUM





Left: Exhaust steam preheater on feed stream of distillate treater, Skelly's El Dorado refinery. Right: Charge pump and manifold arrangement for the treating process operated by Skelly Oil Co.

thermometers are installed upstream and downstream at the exchanger to aid the operator in making adjustments to obtain the desired temperature in the distillate stream.

The cupric chloride reactor is next in line. This vessel has a 12 by 12-ft. cylindrical section and a conical bottom. The reactor is mounted on a cylindrical skirt resting upon the concrete apron supplied for the treating unit. Capacity of the reactor is calculated on a basis of 75 per cent of the hourly throughput and will contain approximately 225 bbl. of raw product and treating material. The copper slurry has the following composition:

		Per cent by weight
Attapulgus clay, 200 mesh	100 lb.	78
Cupric chloride crystals	14 lb.	11
Water	1.75 gal.	11

This composition is based on the calculated requirements for each 1,000-bbl. per day throughput, and, since the unit is currently treating an average of 5,500 bbl. daily of 600° distillate, the total amount of slurry in circulation is 687.5 lb.

The slurry is prepared in a "mix pot" or blow case placed beside the reactor. The clay is poured directly from containers, kraft-paper bags, into the blow case, followed by the addition of cupric chloride crystals and water. The blow case is then shut in, the outlet opened, and the slurry displaced with a stream of raw distillate. Cleaning of the case is accomplished with compressed air prior to receiving another mix. Because of gradual dissipation of the reagent the charge receives an occasional makeup of 8 lb. of clay, 3 lb. of cupric chloride crystals, and sufficient water to maintain the initial moisture content for each 1,000 bbl. per day throughput.

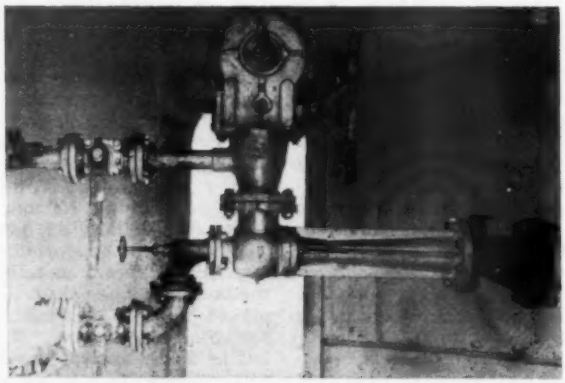
Contact between the distillate and the reagent is accomplished at the apex of the inverted cone through a 4-in. eductor. Velocity of the distillate stream pulls the reagent from the reactor and produces an intimate mixture in the eductor and the 6-in. transfer line which leads back to the reactor. Both are released in the center of the cylindrical section of the reactor near the contact point of the conical bottom through an expansion nipple which disperses the slurry downward towards the apex of the cone. Adequate residence time is provided in the cylindrical section of the contactor to permit complete precipitation of the reagent from the distillate.

Distillate leaves the top of the contactor through a 4-in. line equipped with a constant-pressure regulator. This line leads to a 10 by 40-ft. horizontal tank where the treated distillate is water washed. Washing is accomplished by recirculation of water with a small motor-driven centrifugal pump. Water and distillate are discharged through a mixing device and finally separated in a horizontal vessel. Washed distillate flows from the top of the tank to a second vertical vessel, an approximate duplicate of the first tower and containing a similar amount of No. 7 rock salt for removing any traces of moisture that may be present.

The copper slurry-treating unit was designed originally for use with oxygen to complete the reaction. Since an adequate supply of air is available from the refinery compressor plant it is employed instead of oxygen.

The original design of the plant provided for air to be introduced in a mixing device placed between the charge pump and the first salt tank. However, operating changes were made so that the required volume of air now enters the charge stream at the centrifugal pump suction. With this change, air can be supplied at a lower pressure, saving on the cost of compression. The volume of air required for this plant is calculated at a rate of ½ cu. ft. per barrel of raw distillate for each 0.01 weight-per cent of mercaptan sulfur.

When the plant was first designed, its purpose was to treat motor-fuel stocks by converting the mercaptans to disulfides. Immediately after completion, it was employed to treat kerosine, and shortly thereafter, it was placed in full operation on 600° e.p. distillate. A normal run for each 24-hour day is approximately 23 standard 10,000-gal. tank cars, easily accomplished from refinery rundown tanks to finished storage. The unit provides a sweet, noncorrosive product meeting the requirements for such distillates.



This eductor efficiently mixes slurry and product in the reactor.

PROGRESS in METALS

by W. L. Nelson
Consulting Engineer

Nondestructive Testing

NONDESTRUCTIVE testing methods are being looked to more and more for the economical solution of inspection problems in our highly mechanized industry. For this reason, a symposium was conducted by Committee E-7 of the American Society for Testing Materials to acquaint engineers and technical management with the advantages and uses of nondestructive testing.

The opening paper at the Fifty-third annual meeting at Atlantic City (June 26, 1950), by R. C. MacMaster and S. A. Wenk, provides an excellent and badly needed "Basic Guide for Management's Choice of Nondestructive Tests." It summarizes the basic principles and essential parts of nondestructive tests, and gives the significant features of 12 basic test methods. Perhaps of most value is the compilation of 250 patents and 500 technical articles. The patents have been classified by method of testing, and important operating features are tabulated in 24 appended tables.

K. R. Van Horn in his paper described "Defects or Discontinuities That Can Be Revealed in Cast and Wrought Metal Products by Nondestructive Tests." By use of carefully chosen examples he showed the indications of defects obtained by several different test methods, including radiography, ultrasonics, and magnetic-particle inspection.

That much time, trouble, and money can be saved by use of the right testing method at the right time was demonstrated in the paper "The Economics of Special Inspection Problems," presented by L. W. Ball. The author cited numerous cases in which the failure to use nondestructive testing, particularly in the development stages of product design and manufacture, caused serious failures and much wasted effort.

The remaining papers of the symposium took up the role of nondestructive testing in the inspection of various types of materials and products. J. W. Juppenlatz, in "The Role of Nondestructive Testing in the Economics of Castings," pointed out that nondestructive testing permits evaluations of the inherent qualities of a casting without destroying its usefulness, and that it will continue to be a force promoting the growth and economic state of the casting industry.

C. D. Moriarty covered wrought-steel inspection in his paper, "The Economics of Wrought Steel Inspection." Radiography, he pointed out, is not suited for inspection of wrought steel. Magnetic-particle inspection, being primarily a surface test, can be used early in the manufacturing cycle, but its best role is as a final inspection. Liquid-penetrant methods on nonmagnetic material are similar to magnetic-particle tests in this respect. Magnetic analysis methods indicate nonuniform subsurface conditions and can be used where it is not important to distinguish between nonuniformities caused by discontinuities and those caused by magnetic permeability changes.

Gray Iron Castings Specifications

(3. PIPE, FITTINGS, VALVES, AND FLANGES)
(The A.S.A. also concurs with A.S.T.M. A44-41; A142-38; and A126-42)

GRAY IRON PIPE

Specifying Body and Spec. No.—	Class thickness (in.)	Required chemistry: Per cent S max.	Required chemistry: Per cent P max.	Minimum tensile strength (psi.)	Tranverse properties (min.): Strength lb. 1 by 2-in. bar	Tranverse properties (min.): Deflection in 24-in. span (in.)	Talbot strip test[1]: Minimum mod. of rupture (psi.)	Talbot strip test[1]: Maximum mod. of elast. (secant)	Hydrostatic test (psi.)	Other tests	Brinell hardness (min.)	Use
A.S.T.M. A44-41	Under 0.61	0.10	0.90	.....	1,900	0.30-0.0001	[2]30,000	10,000,000	200-450[3]	Ring[4]	.....	Cast iron pit-cast pipe for water and other liquids (must be cast vertically in dry sand molds)
	0.61-0.90	0.10	0.90	.....	2,000	breaking load-	30,000	10,000,000	.....	Ring	.....	
	0.91-1.60	0.10	0.90	.....	2,200	spec. min.	30,000	10,000,000	.....	Ring	.....	
	1.61-2.50	0.10	0.90	.....	2,300	breaking load	30,000	10,000,000	.....	Ring	.....	
A.S.T.M. A74-42	.....	0.11	0.90	[2]21,000	1.2-in. bar-18-in. span 1,750	0.20	.....	.....	50	.....	..	Cast iron soil pipe and fittings
A.S.T.M. A142-38	Standard	0.12	0.90	.....	..	....		Acceptance based on three-edge			Lb. per ft. 2,500 D	Cast iron culvert pipe
	Heavy	0.12	0.90	.....	..	....		bearing test of pipe section			3,000 D	
	Extra heavy	0.12	0.90	.....	..	....		D = nominal inside diameter in ft.			4,000 D	
Federal WW-P-356	.....	0.11	0.90	Pipe up to 3-in. diameter must meet transverse test on 24-in. span			4.0-in. diam. pipe and larger 40,000	[2]12,000	100	.....	.....	Pipe, cast iron, drainage, vent, and waste (threaded)
Federal WW-P-401	.....	0.11	0.90	[7]18,000	1.2-in. bar-18-in. span 1,900	0.20	.....	.....	50	.....	.. ..	Pipe and pipe fittings; soil cast iron
Federal WW-P-421	Type 1	0.10	0.90	Centrifugally cast in metal molds			40,000	12,000,000	500	.....	Max. 95 R	Pipe; water, cast iron (bell and spigot)
	Type 2	0.10	0.90	Centrifugally cast in sand lined molds			40,000	[2]10,000,000	....	.....	95 R	
	Type 3	0.10	0.90	Horizontally cast in green sand molds			40,000	[2]10,000,000	....	.....	95 R	
	Type 4	0.10	0.90	Cast in sand molds			40,000	[2]10,000,000	....	.....	95 R	
	Type 5	0.10	0.90	Vertically cast in dry sand molds			30,000	10,000,000	....	.....	95 R	

GRAY IRON PIPE FITTINGS, VALVES, FLANGES (ALSO SEE SPECIFICATIONS A-74-42 AND WW-P-401 ABOVE)

					1.2-in. bar-12-in. span							
A.S.T.M. A126-42	A	0.12	0.75	[2]21,000	[2]2,200	[8]0.10	.....	.....	....	.....	.....	Gray iron castings for valves, flanges and pipe fittings
	B	0.12	0.75	31,000	3,200	0.12						
	C	0.12	0.75	41,000	4,000	0.12						
Federal WW-P-491	Types 1-3	0.12	0.75	....	..	.	.....	.....	Air Press[10] 60	.....	.....	Pipe fittings, cast iron drainage
Federal WW-P-501B	A-125-lb.	0.12	0.75	.....	....	.....	.....	....	[11]80	.....	.. ..	Pipe fittings, cast iron (screwed) 125 and 250 lb.
	B-250-lb.	0.12	0.75	.. ..	....	....	.....	.....	80	.....	..	
Federal WW-V-58	A-125-lb.	0.12	0.75	[12]21,000	....	....	.....	.....	Hydrostatic		...	Valves, cast-iron gate; 125- and 250-lb. screwed or flanged (for land use)
	B-250-lb.	0.12	0.75	[12]31,000	....	....	.....	..... Twice steam pressure rating[13]				
Navy 45P2f	A-125-lb.	Not specified					.....	.....	[11]80	.....	...	Fittings, pipe, iron (cast), threaded
	B-250-lb.	Not specified					.....	.....	80	.....	.	

1. For dimensions of Talbot strip see Fig. 1, A.S.T.M. Specification A44-41.
2. Alternate test at contractor's option or at request.
3. Pressure dependent on pipe diameter and barrel thickness (see Section 13, A.S.T.M. A44-41).
4. Alternate test should show minimum modulus of rupture = 31,000 psi. maximum modulus of elast. = 15,000,000 (see Fig. 2, A.S.T.M. A44-41).
5. Optional.
6. May exceed this value provided corresponding modulus of rupture exceed minimum value by same or greater percentage.
7. Omitted unless specified.
8. See cast tensile specimen Fig. 1, A.S.T.M. Specification A126-42.
9. Use of test bars and specifications in A.S.T.M. Specification A48-48 for Classes 20, 30, and 40, optional.
10. Shall not leak as determined by submerging part in water during test.
11. As an alternate test, Types A and B may be subjected to hydrostatic pressures of 250 and 500 psi. respectively.
12. Not included in specification, but stated as illustrative of grade of iron acceptable for application.
13. Valve disk or seat ring shall not leak when tested at 40 per cent in excess of steam pressure.

A strange breed of "cat" ... cat-equipment, that is!

ONE of the unusual types of equipment Kellogg is frequently called upon to fabricate is the cat-poly reactor. A strange breed of heat exchanger, it is in reality a combination pressure vessel and heat exchanger, inasmuch as operating pressures in the catalyst-packed tubes reach 1200 psi. Another unusual aspect of these exchanger-vessels is that they are designed to be taken out of service regularly for replacement of catalyst, rather than being built to operate without maintenance for as long a period as possible.

Fabrication of this type of equipment is unusual, too, in the heat exchange field. First, it's on the "grand" scale, tubes being 5 inches in diameter and 40 feet long, and the shells 50 inches in diameter. But probably the most important single fabrication step is *the welding of the tubes to the tube sheets*, replacing the customary roll-in operation. Here Kellogg's unusually broad experience in welding techniques asserts its importance... guarantees the customer finished cat-poly reactors in the minimum time with the maximum service life built in.

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An even dozen Kellogg cat-poly reactors are installed in this brand new East Coast refinery. Another three-quarter dozen are now being finished in Kellogg shops, destined for a Midwest plant operated by the same refiner.

Continuing Basic Study of the principles of heat exchange conducted by Kellogg development groups for more than twenty years has produced unduplicated design data.

Shop Layout Craftsmen are fully experienced on all types of heat exchanger fabrication from gigantic marine condensers to intricate jet motor combustion-chamber shells.

To master temperature, pressure and chemicals use

M. W. KELLOGG

process equipment

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Special Shop Techniques permit the economical fabrication of the component parts for each heat exchanger as an individual production order and provide every exchanger with the advantages of "tailor-made" fit and serviceability.

Rigid Quality Control maintained by inspectors reporting directly to *Shop Management* rather than to *Production* executives, maintains quality of work at a much higher level than could be attained by customary control methods.

Heat Exchangers
Process Piping
Bends and Headers
Giant One-Piece Bends
Pressure Vessels
Vacuum Vessels
Fractionating Columns
Drums and Shells

★

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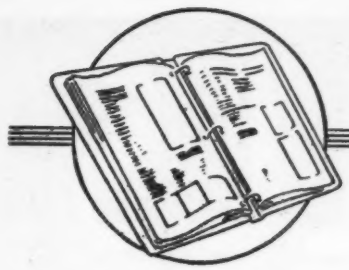

THE REFINER'S notebook

Tri-Act Control Settings

WHEN results like that shown in Fig. 2B, Installment No. 48, are obtained, it is often possible to increase the proportional response or narrow the proportional band and obtain better characteristics. This can be accomplished in the normal way by increasing the sensitivity in the first portion of the circuit or it can be done in the reset relay. (Refer to Fig. 1, Installment No. 48.) In Fig. 1 of this installment the proportional band of the reset relay is indicated as half of its previous width. Note that it is still located during the startup period on the unfavorable side of the control point. While the reset relay illustrated in Figs. 2A and 2B, Installment No. 48, can be considered to have a gain of 1, the reset relay illustrated in Figs. 1 and 2 of this installment has a gain of 2. In Fig. 2 the sensitivity of the controller has been further increased and an ideal startup characteristic is illustrated.

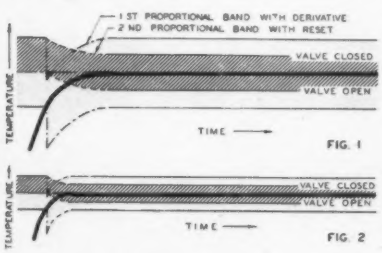

FIG. 1

FIG. 2

Now this is all very well, the experienced instrument man might say, but how do I know that when the instrument is properly adjusted to prevent overpeaking it will respond in a satisfactory manner to load changes without excessive deviations from the control point when load changes occur? One would think that on difficult applications the throttling range or proportional band would have to be widened excessively in order to prevent overpeaking, and this in turn would allow the temperature to deviate too much with load changes. The facts are that the sensitivity must be lowered excessively, but it can be shown that this new controller can produce exactly the same responses to load changes as the more conventional controller with the sensitivity dial set at a considerably lower value. Furthermore, there are new values of the derivative time and reset rate which must be used if the full benefits of the proposed control circuit are to be obtained. While work is under way to illustrate this by means of analogs and actual field tests, the easiest approach to the problem is through mathematics.

Without developing the equation in detail, the controller in Fig. 1, Installment No. 48, can be described by:

$$\frac{dp}{dt} = n(1 + RT')\,S'\left[\frac{R'}{1+RT'}(x - x_o) + \frac{dx}{dt} + \frac{T'}{1+R'T'}\frac{d^2x}{dt^2}\right] \quad (1)$$

It will be noted that in Equation 5 of Installment No. 49, R, S, and T have been used to denote the controller adjustments in the conventional controller. In Equation 1 above, R', S', and T' are the adjustments in the proposed new controller while the "n" is the gain in the reset relay. Note that this gain factor "n" multiplies the proportional response in the same way that the sensitivity (S) does.

Now, if the new controller and the conventional three-function controller are to perform in an identical manner in response to load changes, the coefficients of each term in the equation must be equal.

Response—	Coefficients in conventional controller	Coefficients in proposed controller	
Proportional	$\frac{1+RT}{1-RT}\,S$	$= n(1 + R'T')\,S'$	(2)
Reset	$\frac{R}{1-RT}\,S$	$= nS'R'$	(3)
Derivative	$\frac{T}{1-RT}\,S$	$= nS'T'$	(4)

Since we are interested in the dial readings on the new instrument in terms of the dial readings on the old interacting or three-function instrument these three equations may be solved:

$$nS' = \frac{S}{1-RT}, \quad R' = R \quad \text{and} \quad T' = T \quad (5)$$

$$nS' = \frac{RTS}{1-RT}, \quad R' = \frac{1}{T} \quad \text{and} \quad T' = \frac{1}{R} \quad (6)$$

How the control settings on the new controller correspond to the settings of the conventional three-function controller will be summarized in the next and concluding installment of this instrument series in the Refiner's Notebook.

*Portion of paper, "Tri-Act Control—A New Concept," by R. E. Clarridge, Taylor Instrument Cos., presented at fifth annual instrument symposium, Texas A. & M. College.

No. 50 in current series. The Refiner's Notebook has been published continuously since 1944.

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1 INDUSTRIAL WATER CONDITIONING. Industry's three enemies of profit control; scale, corrosion, and algae, and how they can be controlled, are presented in a most interesting brochure. *Aquatrol, Inc.*

2 MECHANICAL-DRAFT FANS. An extensive line of mechanical-draft fans for both forced and induced-draft service is described in a new 20-page illustrated catalog. This two-color booklet also includes several performance curves showing efficiencies of various types of fans over a wide range of speed and delivery conditions. *Green Fuel Economizer Co., Inc.*

3 SINGLE DRUM HOIST. A new 16-page bulletin describes the complete line of single-drum multipurpose hoists for mines, construction jobs, oil fields, and industrial plants. The bulletin contains complete description and specifications for hoists with capacities from 500 to 3,500 lb. *Joy Manufacturing Co.*

4 HYDRAULIC VALVE CATALOG. Ninety different models of hydraulic valves are illustrated and described in the new catalog Section 202. This two-color book has 52 pages devoted to illustrating and describing nearly every type of four-way hydraulic valves offered in the industry. Description of each model valve includes working drawings, specifications, cutaway views, and operational diagrams of piston designs. *Rivett Lathe & Grinder, Inc.*

5 LUMMUS AT CIT-CON is a pictorial coverage of the new refinery at Lake Charles, La., the joint enterprise of Cities Service Oil Co. and Continental Oil Co. *Lummus Co.*

6 HI-TEMP OILS. This well-illustrated leaflet completely describes the testing procedure used by Houghton's research staff in setting up three series of Hi-Temp oils to meet all high-temperature lubricating conditions up to and even over 500° F. *E. F. Houghton & Co.*

7 PROTECTION YOU CAN SEE THROUGH describes a new approved gas-mask face piece which provides chin-style, chest-style and hose-mask connections in one unit and retains all the full-vision advantages. *Acme Protection Equipment Co.*

8 METAL SCAFFOLDING. All-metal scaffolding built up of standard steel pipe and patented fittings is described and illustrated in a six-page bulletin. *Amidon Sales Co.*

9 IDEAL TYPE 50-A CONSOLIDATED RIG. This new 16-page bulletin emphasizes general air operation of the rig, increased diameter of the main hoisting drum, and unitized "narrow type" chain compound drive group constructed integrally with extended draw-works skids. Principal units are separately illustrated and described, including drum-shaft and transmission assemblies, drum-shaft brakes, rotary-drive countershaft, and controls. *The National Supply Co.*

10 WIRE ROPE FOR EXCAVATORS. This catalog has in it a

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Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, Dec. 14, 1950

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unique feature. Under the heading of recommendations, actual recommendations for specified usages have been listed. Included is the wire-rope code. *John A. Roebling's Sons Co.*

11 DATA ON CHEMICAL COMPOSITIONS OF SEAMLESS ALLOY-STEEL TUBING is the company's seamless alloy-steel tubing, specifically B&W Croloy steels of the low and intermediate alloy groups. These apply to pipe for high-temperature service and tubing for use in heat exchangers, condensers, refinery stills, boilers, and superheaters. *The Babcock & Wilcox Tube Co.*

12 MOTOREDUCER RIGHT ANGLE TYPE EB. A new bulletin illustrating and describing the new all-steel, right-angle Motoreducer which combines the advantages of the standard Motoreducer with the adaptable right-angle head. This Motoreducer can be used for either horizontal or vertical applications and is available with output shaft single or double ended. *The Falk Corp.*

13 CONDENSER CIRCULATORS. Condenser circulators, in standard sizes to 100,000 g.p.m., and in special sizes to 200,000 g.p.m. are illustrated and described in a new catalog No. G-1050. Designed for powerstation service, the pumps described are vertical, mixed flow units of large capacity and low head. *Economy Pumps, Inc., Div. of Hamilton-Thomas Corp.*

14 MECHANICAL PACKINGS. Compiled in an easy-to-read style, this new 32-page catalog guide graphically illustrates and describes Flexrock mechanical packings, including Flexrock process packing which is self-forming, self-lubricating, and self-sealing. Included is a simplified recommendation chart. *Flexrock Co.*

15 NEW TORCH CATALOG. This colorful, 36-page, illustrated catalog contains detailed information on a complete line of welding and cutting torches, outfits, tips, and accessories. Cutaway views of the various parts of both welding and cutting torches, as well as welding and cutting pressure charts, make this catalog a valuable refererice book. *Air Reduction Magnolia Co.*

16 SUPER-SILVERTOP STEAM TRAPS are described in bulletin No. 550. This four-page bulletin contains specifications, capacities, sizes, pressures, weights, and list prices of all principal types of Super-Silvertops. *V. D. Anderson Co.*

17 HERE IS "miniPUMP." Bulletin MP-50 describes a controlled-volume pump that will handle liquids in the cc. per hour range with precise metered accuracy. Range is from 3 to 800 cc. per hour. *Milton Roy Co.*

18 RUBBER PRODUCTS FOR THE PETROLEUM INDUSTRY is an 18-page catalog of heavy-duty hose for most needs of the petroleum industry. *Carlyle Rubber Co.*

19 DROP-FORGED STEEL SOCKET WELD END FITTINGS is a four-page, illustrated data sheet giving details on a line of fittings ranging in size from ½ to 4 in. *Scotstoun Iron Works.*

20 MODEL D LINK CHAIN PULLIFT. A portable device for hoisting or pulling in maintenance, production, and stretching jobs, with capacities up to 3 tons is covered in this two-color data sheet. *Yale & Towne Manufacturing Co.*

21 ELLIOTTROL TRIMODE CONTROLLER. Publication G.127A is a new booklet summarizing the outstanding features and applications of a pneumatic, automatic, remote control device capable of exercising three-term control. *Elliott Brothers, Ltd.*

22 HIGH-SPEED SYNCHRONOUS MOTORS. This four-page bulletin illustrates the principal features of synchronous motors rated at from 100 to 6,000 hp. *Electric Products Co.*

23 SELECTED PACKINGS AND JOINTINGS is a six-page folder describing all purpose packings for low, medium, and high pressures. *George Angus & Co., Ltd.*

24 CROCKER-WHEELER EXPLOSIONPROOF MOTORS. A totally enclosed, fan-cooled motor for use in atmospheres containing gasoline, petroleum, naphtha, benzene, butane, propane, natural gas, or other inflammable vapors is thoroughly described in this four-page, two-color bulletin. *Elliott Co.*

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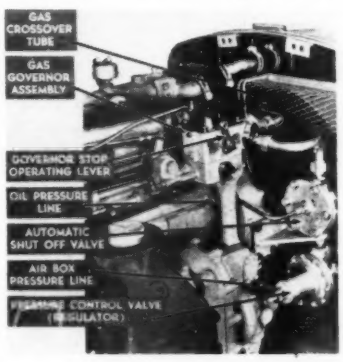
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

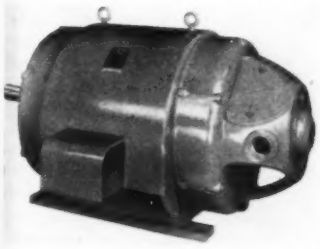
by Dan B. Miller

25 DUAL-FUEL UNIT. A new option on Series 71 diesel engines enables them to burn natural gas in accordance with true diesel high-compression principles. This option is available both on new engines leaving the factory and engines already in use. For the latter a factory-engineered kit is available for the changeover. The changeover permits the engines to burn either natural gas with a pilot charge of diesel fuel or diesel fuel alone. There is no interference with the operation of the unit as a straight diesel fuel engine when required. Change from dual-fuel to diesel-fuel operation is accomplished instantly by moving a small lever on the gas governor assembly. *Detroit Diesel Engine Division.*



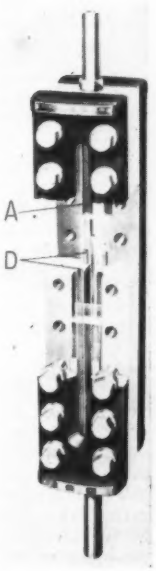
IT'S NEW CHECK IT

26 HEAVY-DUTY, WOUND-ROTOR INDUCTION MOTORS. These motors provide variable speed drive, and are also advantageous on applications requiring high starting torque and low starting current, or long acceleration periods. Built in ratings from 30 to 1,500 hp., drip proof construction is furnished as standard on these motors. Splashproof or enclosed, forced-ventilation models are also available. They are available with either ball or split-sleeve-type bearings to provide long wearing qualities, and are easily accessible for inspection and maintenance. Brush pressure is easily adjusted with a ratchet wheel brush tension adjuster. *Electric Machinery Manufacturing Co.*



IT'S NEW CHECK IT

27 IMPROVED GASKETS FOR HIGH-PRESSURE WATER-LEVEL GAGES. When glasses or gaskets of high-pressure water-level gages are replaced, Yarway flat-glass inserts are not fitted with improved gaskets coated with special compound that prevents adhering to the gage metal surfaces under high-pressure and high-temperature service. This Frelon gasket is the molded pressure-sealed gasket (D) located in the grooves of the gage insert body. Illustration shows other details of the pressure-sealed floating assembly flat-glass water-level gage. *Yarnall-Waring Co.*



IT'S NEW CHECK IT

28 AIRFUGE. A complete line of separators for cleaning compressed air by means of centrifugal force are available in seven inlet and outlet tapping sizes, from ½ to 2½-in. Airfuge removes 99 per cent or more of all impurities from compressed air without pressure drop. Moisture, oil, scale, and other solids in the air are whirled outward to the walls of the unit where they drain down to the trap section. At the same time the clean, dry air passes unimpeded to feed line, operating the equipment without danger of corrosion, wear, clogging, fire, explosion, or freezing. A float-operated trap automatically releases accumulated liquids as they rise to a level above that necessary to effect a seal. Drain valve outlet is tapered to prevent stoppage by particles of scale. *The Swartwout Co.*

IT'S NEW CHECK IT

29 SERIES F-8 BIG JOB. New Ford trucks feature automatic Power Pilot carburetion-ignition control. The system provides power with economy by metering and firing the correct amount of fuel at the right instant under varying loads without spark knock. The clutch

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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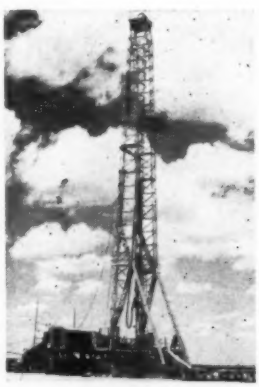
disk on F-8 heavy trucks has been made more rugged for severe service. Cast spoke wheels with demountable rims to provide interchangeability with trailer wheels are now standard but steel-disk wheels still are available. Engine has chrome top piston rings, authothermic expansion control pistons, and new high-lift camshafts. Coolant distribution is improved by means of a larger radiator tank and water bypass tubes on the engine. Exhaust valve stems on all engines are nitrided to help prevent valve sticking. New semirotating valves and valve spring retainers also are aimed at preventing valve sticking and at prolonging valve life. *Ford Motor Co.*

IT'S NEW CHECK IT

30 FULL-VIEW MAST. It is held in the upright position by a pair of auxiliary legs which serve also as a part of the raising mechanism. No braces or girts obstruct the driller's view of the traveling block or derrick man. Drilling floor measures 24 ft. from draw works to pipe ramp and 27 ft. 8 in. from side to side. Raised by means of the traveling block, the Full-View mast is virtually pushed upward to drilling position by a pair of raising legs, pivoted at ground level. Automatic safety locks are engaged by the roller shafts as the mast approaches vertical, holding it in an upright position. It is further secured by manually operated lock jacks. For field moves, the entire rig with mast erect may be skidded between locations; or the mast may be lowered to horizontal, removed from the base, and transported in one, two, or four loads. *International Derrick & Equipment Co.*



IT'S NEW CHECK IT

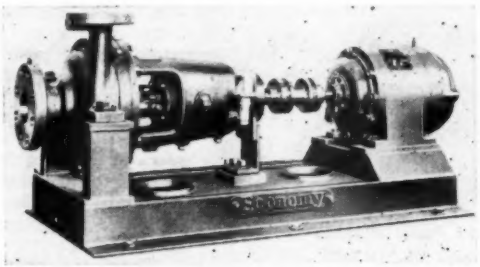
31 ECONALLOY. A new design of heat exchanger provides corrosion resistance at a fraction of the cost of conventional alloy metal units. Corrosion-resistant materials are used only when required; as flange inserts and for the inner tube which contacts the fluid vapor being heated. A corrosion-resistant joint is made without welding to the inner tube. It also provides uniform heat over the full surface from flange to flange without dead spots. It saves space because it forms an integral part of the piping system. It can be supported vertically or horizontally along a wall, or on hangers. Used singly or in groups, it is easily demounted for cleaning, and it is simple to add additional capacity as needed. The line is furnished in sizes from a fraction of a square foot of heating surface to several hundred square feet in lengths up to 30 ft. per segment. Internal tube sizes range from ¼ to 4-in. Standard units are available for pressures up to 900 psi. and temperatures in excess of 700° F. *Martin-Quaid Co.*

IT'S NEW CHECK IT

32 NEW TRUCK CRANE. A new 12½-ton truck-mounted industrial yard crane, known as the Model 40, has an increased swing speed to 6.4 r.p.m., travels at truck speeds, and converts easily to all crane and shovel attachments. Equalizing bear-type suspension and a locking third differential make possible heavy, off-the-road work. An auxiliary transmission provides 10 forward and 2 reverse speeds. The Model 40 lifts, booms, and swings either simultaneously or independently. Standard power unit is a six-cylinder gasoline engine which develops 105 hp. at 3,200 r.p.m. The upper works is inclosed in a weather-proof, inside-bolted cab of a design which permits inside access to all deck machinery. Other features include unit replacement of all subassemblies, a builtin counterweight to shorten rear and clearance of cab, 16-in.-diameter drums for increased life of the wire rope, and antifriction bearings throughout. *Wayne Crane Division of the American Steel Dredge Co.*

IT'S NEW CHECK IT

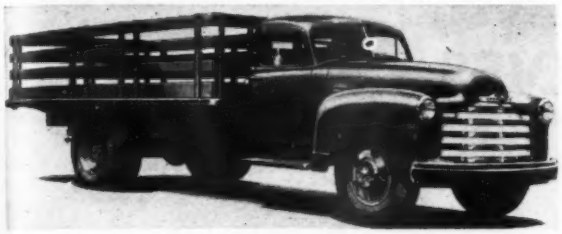
33 TYPE Q PUMPS. The new line is especially designed for use with hot oil, condensate, propane, butane, gasoline, chemical, and process liquors at temperatures up to 800° F. Although materials used in their construction vary for each particular application, pumps have common design features such as vertically split casing with centerline support to maintain alignment at all temperatures; an extra-deep, water-jacketed stuffing box; a special sleeve construction which prevents leakage; and water-jacketed bearing housing for ring-lubricated ball bearings, double-row heavy-duty radial bearings and two matched angular contact thrust bearings installed back to back. Twelve sizes are included in the new line, with capacities ranging from 10 to 1,000 g.p.m. at heads up to 325 ft. *Economy Pumps, Inc., Hamilton-Thomas Corp.*



IT'S NEW CHECK IT

34 1951 CHEVROLET TRUCKS. Chevrolet will make available trucks in 10 wheelbases, including the 179-

in. chassis added late this year. Gross vehicle weights range from 4,000 to 16,000 lb. In this connection an im-



portant development is announced in higher ratings of the 4100 and 4400 series. Through changes in the front axle, springs and tire sizes, the maximum gross vehicle weight has been raised from 12,500 to 14,000 lb. Heavy-duty trucks now have twin-action rear brakes, a design that assures greater braking effectiveness and self-energization of both shoes whether traveling forward or backward. Each brake is equipped with two cylinders and two shoes. *Chevrolet Motor Division.*

IT'S NEW CHECK IT

35 PANALARM BACK-LIGHTED MULTIPLE UNIT SIGNAL. The new Panalarm finds application as a trouble signal in process industries and power plants. It may be used to detect off-normal operation of almost any type of equipment. Combining signal lights and relay in a single sealed container, the new signal forms a complete one-piece unit that plugs into a universal chassis, making it both easy to install and easy to service. In order to insure against loosening of plug-in device, a simple, effective lock-in arrangement consisting of a locking stud, fastens to the chassis and extends through a hole in the signal unit. Panalarm back-lighted cabinets may be obtained with any number of alarm units, depending on requirements. *Panalarm Products Co.*

IT'S NEW CHECK IT

36 ALL-METAL THERMOMETER FOR PRESSURIZED OIL STORAGE TANKS. A new adaption of the Model 2221 all-metal thermometer has been developed to overcome the breakage problem encountered with glass thermometers. These sturdy instruments are designed to fit the sockets already incorporated in many pressurized storage tanks used throughout the petroleum industry. The thermometer covers a range from 0° to 150° F., with the scale marked in 1° divisions. Accuracy is within 1° over the entire scale. The instrument has a 5-in. dial and a stem 3 ft. long, with the measuring element in the first 2 in. Construction is fumeproof, moistureproof, and corrosion-resistant throughout. *Weston Electrical Instrument Corp.*

IT'S NEW CHECK IT

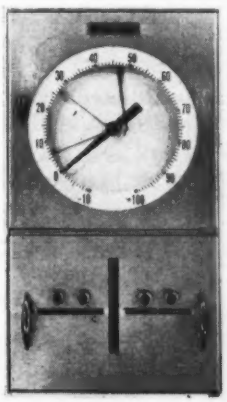
37 HIGH-PRESSURE REDUCING VALVE, TYPE "E." Important improvements have been made on the type "E" high-pressure reducing valve which handles working pressures as high as 6,000 psi. The valve is now furnished with Stellite-faced main valve and Stellite-faced seat ring. Stellite posseses great hardness, is unusually tough, and is highly resistant to corrosion. Where corrosion is combined with abrasion Stellite is doubly valuable. It has a strength of over 100,000 psi. at ordinary temperatures and over 65,000 psi. at 1,500° F. Design changes have also been made in the body thereby simplifying and strengthening it. The body is of the strongest steel. Other internal metal parts are of hard chromium-plated stainless steel. The packings are specially made for the high-pressure service. The pressure on the seat is balanced by a piston above. It handles water, oil, or air. *Atlas Valve Co.*

IT'S NEW CHECK IT

38 TRACE UNITIZED PORTABLE SEISMOGRAPH complete with 24 amplifiers, housed in one water-tight stainless-steel case, weighs 55 lb. Amplifiers are high-gain AVC or expander type with individual gain controls. Filter switches, high-line eliminators, and builtin cable testers are provided on each amplifier channel. Unitized construction eliminates troublesome jumper cables, and the need of several men for carrying purposes. Wide choice of filters meet the requirements of all areas. New type circuit provides excellent record control. *Technical Instrument Co.*

IT'S NEW CHECK IT

39 CONTINUOUS COMBUSTIBLE GAS ALARM SYSTEM incorporates a new, more accurate principle of gas and vapor analysis and measurement. The improved precision of analysis is achieved by use of new filament construction employing fine platinum wire and a thermocouple, and by measuring and recording the actual increase in temperature of the wire. Zero drift has been virtually eliminated, and consequently the system can be used as a continuous detection and alarm system for the protection of processes, plants, and personnel. It functions as a stable system insuring constant zero balance over holidays, without attention, and for process control requiring a constant proportioning of combustibles in air. *Davis Emergency Equipment Co.*



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PIPE LINES

Burden Starts Project

O. R. Burden Construction Co. is doing preliminary work for the laying of a 56.5-mile, 10¾-in. products pipe line for Texas Pipe Line Co. between Lawrenceville, Ill., and Mount Vernon, Ind., according to Oscar R. Burden, president.

In announcing the project, R. B. McLaughlin, president of Texas Pipe Line Co., mentioned that it will parallel the Texas 6-in. line now in operation.

The Burden organization has a field office at Mount Carmel, Ill., for the spread supervised by Pete Hiner. Clearing of right-of-way is now in progress and preparations are being made for laying 5 miles at the Wabash River crossing. The first pipe will arrive this month from Napa, Calif.

Early this week Burden crews completed two jobs in Texas: 37 miles of 8-in. and 14 miles of 6-in. near Alvin for Phillips Pipe Line Co.; and 16 miles of 8-in. near Gladewater for Pan American Pipe Line Co.

Gathering Lines Planned

WASHINGTON. — Texas Illinois Natural Gas Pipeline Co. has announced plans to build 72 miles of additional gathering lines in Texas following the authorization of the Federal Power Commission to increase system capacity by some 60 million cubic feet of natural gas daily. Cost of the new construction is estimated at $11,216,800.

The new gathering lines will be 20 in. in diameter, with construction scheduled to start early next year. The system will originate about 50 miles north of the La Gloria field in Jim Wells County, extending to the Clayton natural-gas area in Live Oak and McMullen counties, and to the Hagist Ranch natural-gas area in Duval County.

The company now has under construction its 1,331-mile main artery from Texas to Illinois, costing an estimated $117,000,000. Actual completion is now reported on 280 miles with a turn-key job set for November 1951.

Midland Line Operating

MIDLAND, Tex.—Flow has started in the pipe-line outlet for Tex-Harvey field of Midland County, now connecting 27 completed oil wells with the East Midland tank terminal of Basin Pipe Line System. Built and operated by Tex-Harvey Pipe Line Co., Midland, it is the joint property of that company and Ashland Oil & Refining Co.

Capacity of the carrier is 12,000 bbl. daily, a volume which could be increased to 18,000 bbl. daily by more pumping equipment being installed. The discharge line is 15 miles long with 14 miles of 6-in. pipe and the remainder 8-in. It is tied into the 27 wells through 9 miles of 6-in. and 4-in. gathering lines. More gathering lines are being laid to be ready for wells as they reach completion.

The field oil is collected in tanks where it flows into the discharge line to the Basin terminal. There it enters the trunk line for carriage to Ashland's Kentucky refinery. All production from the Tex-Harvey field is being bought by Ashland.

Iraq Line Nearly Complete

Laying of a 75-mile pipe line from Zubair field in southern Iraq to a Persian Gulf terminal at Fao is now nearly complete, but considerable additional work on other facilities is necessary before commercial production of this new field can begin.

The Zubair discovery was made early last year by Basrah Petroleum Co., Ltd., a member of the Iraq Petroleum Co., Ltd., group. Four productive wells have been completed, and several rigs are in operation. The pay is Cretaceous sand at about 11,000 ft.

About 25 per cent of the length of the pipe line is 16-in. from the field end, and the remainder is 12-in. On account of the low ground directly between Zubair, which is about 15 miles southwest of Basrah, and Fao, the line extends northeastward to the Shatt-el-Arab River, and then south to the terminal site.

One problem encountered in the plans to move the crude out of Fao is the somewhat congested condition of the river which also furnishes access to Anglo-Iranian Oil Co., Ltd.'s 500,000-bbl. daily refinery at Abadan on the other side in Iran. Careful coordination of the river traffic across the bar to the Persian Gulf is necessary since only 7 to 10 vessels can pass on each tide.

Lines Vie for Market

WASHINGTON. — The Federal Power Commission will render the decision involving three pipe-line companies proposing to bring natural gas into the same area of northeastern Ohio. The companies seeking to serve the same territory are Grand River Gas Transmission Co., and Lake Shore Pipe Line Co., both of Cleve-

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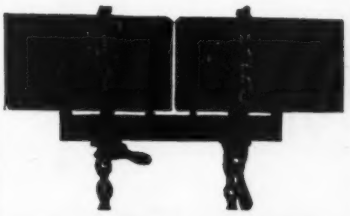

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land; and Erie Gas Service Corp., Oil City, Pa.

The three companies have applied for right to serve substantially the same area east of Cleveland. Also the three companies propose to obtain their supply of natural gas from Tennessee Gas Transmission Co., Houston. The commission recently directed Tennessee to allocate 17,000,000 cu. ft. of natural gas daily for whichever company is certified to serve the market.

New Project Weighed

WASHINGTON. — An application for approval of a crude pipe line from the West Texas fields to California as a defense facility is under consideration by the Petroleum Administration for Defense, whose decision will determine whether the 50 independent Texas producers back of the project will be granted a certificate entitling them to accelerated depreciation.

Accelerated amortization, permitting investments in facilities required for the national defense to be written off in 5 years instead of over the life of the facilities, is provided for in the Defense Production Act.

In addition to the pipe line, the group plans the construction of a large refinery in Arizona.

Suez-Cairo Line Planned

Construction of a pipe line from Suez to Cairo to release trains and trucks now used in the transport of oil and gasoline is included as a feature of a $280,000,000 development program for improvement of Egyptian communications drafted by the Ministry of Communications, it was reported last week by the Egyptian embassy in Washington.

Details of the project were not available, but it was said one of its purposes is to lighten traffic on the Suez-Cairo road. The program is to be financed in part from post-office revenue and in part from an internal loan, it was stated.

The ministry's report stated it would be possible to carry out the entire program within a period of 2 or 3 years and that more than 20 firms are waiting to bid on the individual projects.

El Paso Potentialities

A survey of pipe-line expectancy made by El Paso Natural Gas Co. indicates the transmission system from the San Juan basin may be active for centuries. This new horizon in potential service is based on research that contemplates future development in fuel techniques.

Minimum present resources give the company a proven supply of natural gas for 15 years.

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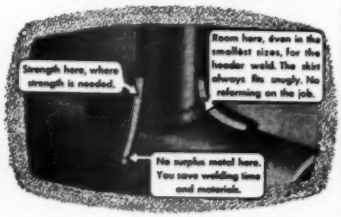
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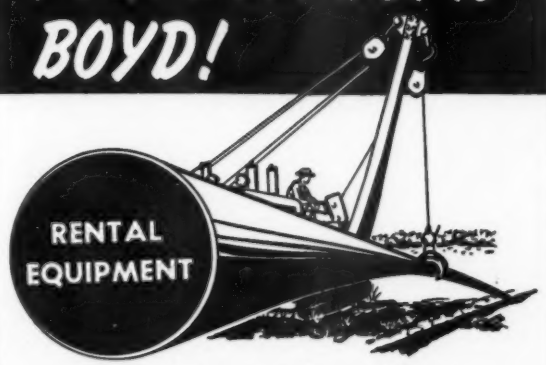

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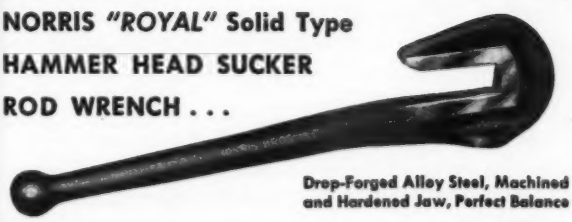

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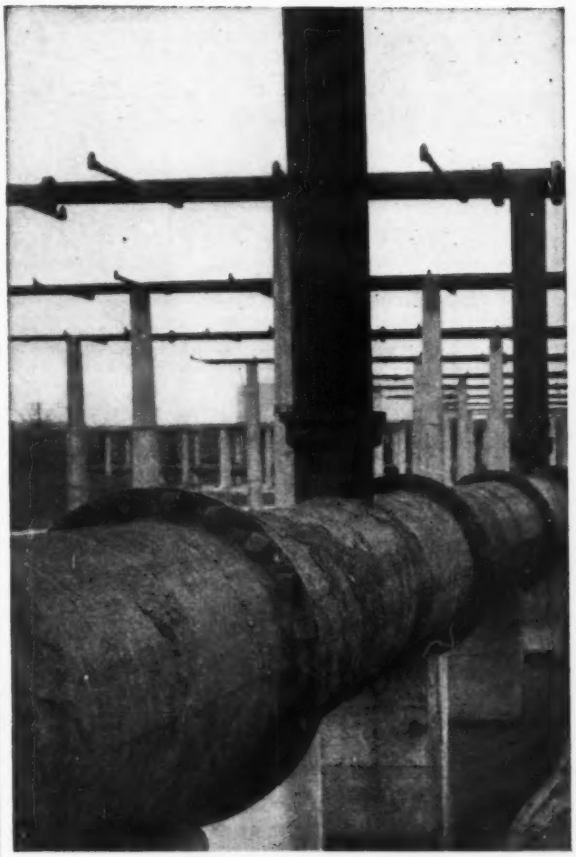

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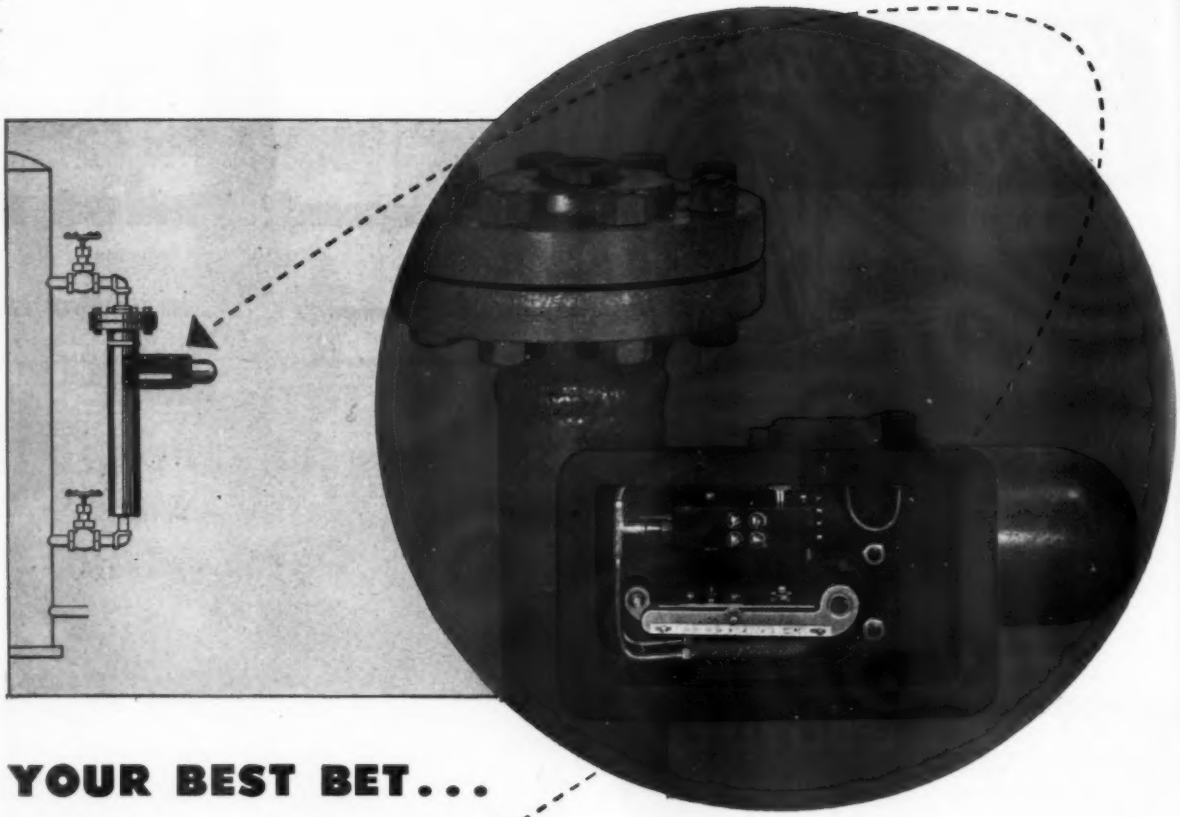

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VALVE PRODUCTS

Pipe-Line Construction

FOLLOWING is a tabulation of pipeline projects which are planned or under construction. Included are crude-oil, products, and natural-gas lines. The list was compiled from surveys made by The Oil and Gas Journal.

Crude-Oil Pipe Lines

Gulf Refining Co., Tulsa Pipe Line Division.—72 miles, 6-in., under way, El Dorado, Kans., to Webb City, Okla.; Pipeline Service Co., contractor. J. W. Welcher, Atlanta, Kans., spreadman.

Lakehead Pipe Line Co., Inc. (American subsidiary of Interprovincial Pipe Line Co., Canada).—321 miles, 18-in., contracted Neche, N. D., to Superior, Wis., to be completed October 1950; Anderson Bros., contractor.

Ohio Oil Co.—54 miles, 20-in., underway in Illinois; Betchel Corp., contractor; S. D. Betchel, Jr., superintendent.

Pan American Pipe Line Co.—80 miles, 10-in., under way, from southern part of Scurry County, Texas, to a connection with Humble pipe line near San Angelo, Tex.; Brown & Root, contractor.

Pelican Oil Co.—60 miles, 6-in., under way, Lake Charles to DeQuincy, La.

Phillips Pipe Line Co.—50 miles, 6-8-in., under way, Phillips tank farm, Sweeny, Tex., to Humble's Webster Station, Galveston County, Texas; O. R. Burden Construction Co., contractor; B. C. Barney Hall, spreadman.

Phillips Pipe Line Co.—25 miles, 8-in., considered, loops between Thrall and Kansas City, Kans.

Platte Pipe Line Co.—1,080 miles, 16-20-in., planned, Worland, Wyo., to Wood River refining area in Illinois.

Portland Pipe Line Co. (Montreal Pipe ine Co., Ltd.).—236 miles, 18-in., contracted, ortland, Me., to Montreal, Que., Canada.

Portland Pipe Line Co. (Montreal Pipe Line Co., Ltd.).—85 miles, 18-in., under way, Portland, Me., to Gorham, N. H.; Oklahoma Contracting Co., contractor of Section 1; H. A. Waylie, Westbrook, Me., superintendent.

Portland Pipe Line Co. (Montreal Pipe (Canada).—321 miles, 18-in., contracted, Gorham, N. H., to international boundary near N. Troy, Vt.; Associated Pipeline Contractors, Inc., contractor of Section 2. Lacy Walker, Barton, Vt., spreadman.

Portland Pipe Line Co. (Montreal Pipe Line Co.).—68 miles, 18-in., contracted, Canadian boundary to Montreal; Fred Mannix, contractor of Section 3.

Service Pipe Line Co.—25 miles, 8-in., under way, Beaver Creek and Riverton, Wyo.; Vaughn & Taylor Construction Co.

Shell Pipe Line Corp.—39 miles, 10-in., under way, McCamey to Kemper, Tex.; McVean & Roberts, contractor.

Texas-New Mexico Pipe Line Co.—16½ miles, 10-in., under way, Scurry County, Texas; O. R. Burden, contractor, Bill Price, spreadman.

West Coast Pipe Line Co.—20-in., planned, Permian basin, West Texas, to California.

Products Pipe Lines

Great Lakes Pipe Line Co.—39 miles, 12-in., under way, Hawarden, Iowa, to Sioux Falls, S. D.; Midwestern Constructors, Inc., contractor, R. C. Stanley, Canton, S. D.

Great Lakes Pipe Line Co.—355 miles, 12-in., authorized, Kansas City through Omaha and Sioux City, Iowa, to Sioux Falls, S. D.

Phillips Petroleum Co.—281 miles, 10-in., proposed, Borger, Tex., to Yale, Okla.

Phillips Petroleum Co. and Shamrock Oil & Gas Co.—155 miles, 6-in., planned, extension on 600-mile line at Phillips, Tex., via La Junta, to Denver.

Plantation Pipe Line Co.—432 miles, 14-18-in., Baton Rouge to Bremen, Ga.—to Charlotte, N. C., Williams Brothers Co., contractor. Completion scheduled by end of 1951.

Pure Transportation Co.—100 miles, 6-in., proposed, Heath to Dayton, Ohio.

Salt Lake Pipe Line Co.—242 miles, 6-8-in., under way, Boise, Idaho, to Pasco, Wash. Completion date, December 1950.

Salt Lake Pipe Line Co.—140 miles, 8-in., contracted Boise, to Baker, Idaho; Bechtel Corp., contractor.

Salt Lake Pipe Line Co.—Contracted, Macco Corp., and Morrison-Knudson Co., Inc.

Salt Lake Pipe Line Co.—120 miles, 6-8-in., under way, Baker, Ore., to Pasco, Wash. Completed August 8, 1950; Pacific Pipeline & Engineers, Ltd., contractor, L. E. Robertson, LaGrande, Ore., spreadman.

Standard Oil Co. (Ohio) and Shell Oil Co.—56 miles, 8-in., under way, Lima to Springfield, Ohio; Tulsa Construction Co., contractor.

Susquehanna Pipe Line Co.—126 miles, 8⅝-in., under way, Toledo, Ohio, to Sarnia, Ont., Canada; H. L. Gentry Construction Co., contractor. James Mitchell, Toledo, Ohio, spreadman.

Natural-Gas Pipe Lines

Acme Natural Gas Co.—25½ miles, 10-in., contracted, Ellwood to Butler, Pa., to be completed December 15, 1950; Williams-Austin Co., contractor. Howard Bauer, Butler, Pa., spreadman.

Alabama-Tennessee Natural Gas Co.—35 miles, 8-in., authorized, Muscle Shoals to Decatur, Ala.

Atlantic Gulf Gas Co. (United Gas Pipe Line Co.).—1,530 miles, planned, Alabama-Florida-Georgia-South Carolina.

Central Kentucky Natural Gas Co.—42 miles, 20-in., under way, North Means compressor station to Foster, Ky; completion date December 15, 1950; Williams-Austin Co., contractor, Leman Creech, Mt. Sterling, Ky., spreadman.

Chicago District Pipe Line Co.—41 miles, 24-in., authorized, loop Calumet pipe line—Joliet, Ill., to Chicago, completion date December 1950.

City of Indianapolis, Inc.—22 miles, 16-in., proposed, Indianapolis to Panhandle Eastern Corp. system.

Coast Counties Gas & Electric Co.—40 miles, 3-4-8-in., considered, coast and valley region, California.

Coastal Pipe Line Co.—1,000 miles, planned, Texas to Norfolk, Va.

Commonwealth Natural Gas Corp.—84 miles, 12-in., contracted, Richmond to Newport News, Va.; Ray L. Smith, contractor.

Commonwealth Natural Gas Co.—20 miles, 8-in., contracted, James River to Newport News, Va.; Ray L. Smith, contractor.

Commonwealth Natural Gas Corp.—104 miles, 18-in., under way, Standardsville to near Petersburg, Va.; Ray L. Smith & Son, contractor, Don C. Smith, Orange, Va., spreadman.

Commonwealth Natural Gas Corp.—537 miles, 20-in., proposed, West Bend, Ky., to Norfolk, Va.

Consolidated Gas Utilities Corp.—41 miles, 12-in., planned, Enid to Blackwell, Okla., Marlow to Cement, Okla.

East Ohio Gas Co.—24 miles, 20-in., authorized, northeastern Ohio to near Petersburg to East Ohio's Austintown station near Youngstown.

East Tennessee Natural Gas Co.—100 miles, planned, lateral to be laid in 1950.

East Tennessee Gas Corp.—150 miles, 16-in., under way, Knoxville to Bristol, Tenn.

East Tennessee Natural Gas Co.—398 miles, 3-16-in., planned, Nashville to Chattanooga to Knoxville, Tenn., and laterals.

East Tennessee Natural Gas Co.—106 miles, 12-16-in., contracted, Lobelville to Tulla-

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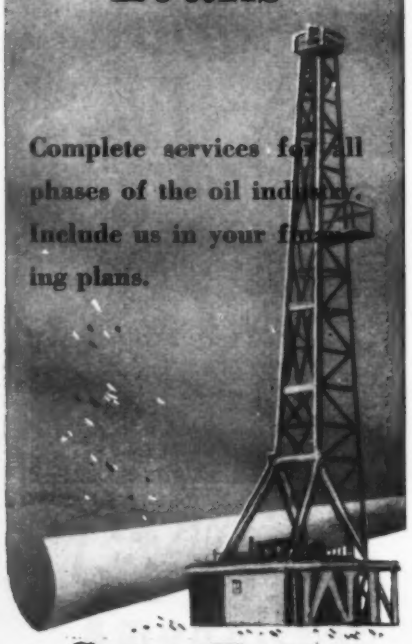

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homa, Tenn.; Oman Construction Co., contractor.

East Tennessee Natural Gas Co.—130 miles, 12-in., under way, Athens, via Chattanooga, to Tullahoma, Tenn.; N. A. Saigh Co., Inc.

East Tennessee Natural Gas Co.—120 miles, 12-in., planned, Chattanooga to Knoxville, Tenn.; Walters & Saigh Construction Co.

East Tennessee Natural Gas Co.—185 miles, 16-in., planned, Lobelville to Chattanooga, Tenn., Walters & Saigh Construction Co.

Eastern Natural Gas Corp.—292 miles, 24-in., proposed, Phoenixville, Pa., via New Haven and Hartford, Conn., Providence, R. I., Springfield, Mass., and Boston.

Egyptian Natural Gas Co.—80 miles, 6-8-in., planned, Norris City to Salem-Centralia, Ill., area.

El Paso Natural Gas Co.—352 miles, 30-in., under way, looping of 26-in., New Mexico-California line and connection with Pacific Gas & Electric Co. at Needles, Calif., to be completed November 1950.

El Paso Natural Gas Co.—450 miles, 24-in., authorized, San Juan basin, New Mexico, to Franconia, Ariz., to be completed November 1951 by company crews.

Home Gas Co.—70 miles, planned, Orange Sullivan, Rockland, and Cattaraugus counties, New York.

Humble Oil & Refining Co.—50 miles, 8-in.; Trawick field to near Longview, Tex.; Trojan Construction Co., contractor.

Jersey Central Power & Light Co.—30 miles, 10-in., planned, New Jersey coast system of Texas Eastern Transmission Co.'s Big Inch.

Lion Oil Co.—60 miles, 6-2-in., gas gathering system in Scurry County, Texas. George Tucker Pipe Line Construction Co., contractor. J. O. Carter, spreadman.

Magnolia Petroleum Co.—60 miles, 4-24-in., gathering system in LaWard and Lolita fields, Texas; Henry L. Lemons & Co. contractor. W. A. Remington, spreadman.

Michigan Gas Storage Co.—150 miles, 20-in., planned, Chelsea terminal-Winterfield and Cranberry Lake, Mich.; Mahoney Contracting Co., contractor.

Michigan-Wisconsin Pipe Line Co.—197 miles, 6-18-in., under way, Milwaukee to Green Bay and Two Rivers, Wis.; G. G Griffis Construction Co., contractor. F. K Egan, Fond du Lac, Wis.

Mississippi River Fuel Corp.—40 miles, 18-in., authorized, Dubach to Perryville, La.

Montana-Dakota Utilities Co. and Montana-Wyoming Gas Pipe Line Co.—335 miles, 12¾-in., under way, Worland, Wyo., to Baker, Mont.; R. A. Conyes Construction Corp., contractor. Al Poggi, Hardin, Mont. superintendent.

New York State Natural Gas Corp.—42 miles, 20-in., Ohio-Pennsylvania line to Bakerstown, Pa.; Tulsa-Williams Co., contractor. O. L. Martin, Darlington, Pa., spreadman.

New York State Natural Gas Corp.—21 miles, 20-in., under way, Tonkin station to Bakerstown, Pa., to be completed December 1, 1950; Williams-Austin Co., contractor. Ralph Gaddy, New Kensington, Pa., spreadman.

New York State Natural.—164 miles, 16-in., planned, Ithaca to Albany, N. Y.

New York State Natural Gas Corp.—70 miles, 20-in., planned, North Oakford, Pa., to Ohio state line.

Niagara Mohawk Power Corp.—35½ miles, 10-14-in., under way, Therm station, to Fulton, N. Y.; Williams-Austin Co., contractor. Howard Bauer, Nedrow, N. Y., spreadman.

Northern Natural Gas Co.—597 miles, 20-26-in., contracted, ten loops from Texas to northern Iowa.

Northern Natural Gas Co.—76 miles, 4 to 12-in., under way, gathering line in vicinity of Hugoton, Kans., Cheek Construction Co., contractor, Troy Cheek, Ulysses, Kans., superintendent.

Northern Natural Gas Co.—111 miles, 24-in., under way, Ogden, Iowa, to St. Paul, Minn.; R. B. Potashnick, contractor.

Northern Natural Gas Co.—75 miles, 26-in., under way, north of Beaver, Okla.; R. H. Fulton & Co., contractor of Loop 2. Merele Lewellen, Mead, Kans., spreadman.

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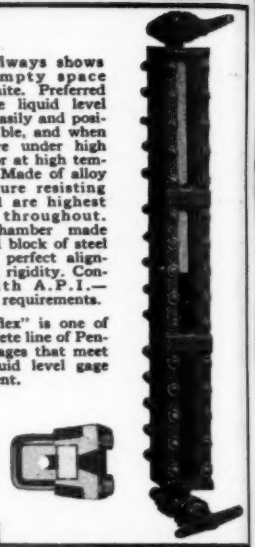

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Northern Natural Gas Co.—33 miles, 26-in., contracted, Mullinville, Kans., station; R. H. Fulton & Co., contractor of Loop 3.

Northern Natural Gas Co.—72½ miles, 26-in., under way, Bushton to Minneapolis, Kans.; R. H. Fulton & Co., contractor of Loop 4. M. L. Boyd, Salina, Kans., spreadman.

Northern Natural Gas Co.—155 miles, 20-in., contracted, Garden City to Bushton, Kans.; R. H. Fulton & Co., contractor of Loop 5. Jerry Nash, Garden City, Kans., spreadman.

Northern Natural Gas Co.—43 miles, 26-in., under way, Palmyra, Neb., station to Oakland, Iowa, station; Midwestern Construction Co., Inc., contractor of Loop 6. M. T. Wilhite, superintendent.

Northern Natural Gas Co.—31 miles, 26-in., under way, north of Ogden, Iowa; R. B. Potashnick Co., contractor of Loop 8. H. F. Carr, Ventura, Iowa, spreadman.

Northern Natural Gas Co.—41 miles, 26-in., contracted, northward from Ventura, Iowa, station; R. B. Potashnick Co., contractor of Loop 9.

Northern Natural Gas Co.—40 miles, 26-in., contracted, Ventura, Iowa, station; R. B. Potashnick, contractor of Loop 10.

Northern Natural Gas Co.—222 miles, 26-in., under way, Borger, Tex., to Nebraska line; R. H. Fulton & Co., contractor. M. C. Boyd, Ashland, Kans., spreadman.

Northwest Natural Gas Co.—750 miles planned, Washington, Oregon, and Idaho.

Ohio Fuel Gas Co.—22 miles, 16-in., authorized, Dayton, Troy, Piqua, and Sidney, Ohio.

Pacific Gas & Electric Co.—47 miles, 8-in., authorized, Salinas to Kilig City, Calif.

Pacific Lighting Corp.—23 miles, 30-in., planned, Inglewood to Encino, Calif.

Pacific Lighting Corp.—41 miles, 30-in., planned, Puente to March Field, California, to be completed 1950.

Pacific Northwest Pipe Line Co.—400 miles, 22-in., gathering lines on Texas Gulf Coast to Pacific Northwest pipe line.

Pacific Northwest Pipe Line Corp.—2,175 miles, 26-in., authorized, Texas Gulf Coast to Pacific Northwest.

Panhandle Eastern Pipe Line Co.—356 miles, 26-in., authorized, looping in Texas, Oklahoma, Kansas, Missouri, Illinois, Indiana, Ohio, and Michigan.

Phillips Petroleum Co.—99 miles, 3-16-in., under way, Sherman and Hansford counties, Texas, gas-gathering system; Vaughn & Taylor Construction Co., Inc., Dumas, Tex.

Piedmont Natural Gas Co.—1,350 miles 20-in., planned, Greenville, Miss., to Carolinas.

Plains Natural Gas Co.—120 miles, 4-24-in., contracted, Oklahoma-Kansas area, Hugoton field, gathering system; Midwestern Constructors, Inc., (Arey-Phillips Construction Co.) contractor. T. S. Nunley, Liberal, Kans., chief inspector.

Potomac Gas Co.—18 miles, 16-in., planned Oranesville to Arlington, Va.

Prince George's Gas Corp.—20 miles, 22-in., authorized between Chillum and Rockville, Md.

Roanoke Pipe Line Co.—30 miles, 8-in., authorized, Gala, Va., to Roanoke.

San Diego Gas & Electric Co.—53 miles, 18-in., planned, San Diego County, California.

San Diego Gas & Electric Corp. (Southern Counties Gas Co.)—85 miles, authorized San Diego, Riverside, and Moreno, California.

South Central Alabama Natural Gas Co., Inc.—150 miles, proposed, central Alabama

South Georgia Natural Gas Co.—248 miles, planned.

South Jersey Gas Co.—75 miles, 10-12-14-in., under way, Pleasantville, N. J., to Bustleton, Pa.; G. G. Griffis, Inc., contractor, Ray Abney, Millville, N. J., spreadman

South Jersey Gas Co.—14-in., under way Franklinville to Bridgeton, N. J.; G. G Griffis, Inc., contractor.

Southwestern Michigan Gas Co.—55 miles, 12¾-in., proposed, Oakland County to Marysville, Mich.

Southern California Gas Co.—83 miles, 16-in., under way, Whitewater, Riverside County, to Puente, Los Angeles County.

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California; Midwestern Constructors, joint contract with Johnson Western Gunite—L. E. Dixon. John Work, Banning, Calif., superintendent.

Southern Counties Gas Co. of California.—81 miles, 20-in., authorized, looping.

Southern Natural Gas Co.—32 miles, 16-in., under way, Wetumpka to Tallassee, Ala.; completion due December 1; Sheehan Pipe Line Construction Co., contractor, C. M. Brown, spreadman.

Southern Natural Gas Co.—180 miles, 18-in., under way, Gwinville, Miss., to Selma, Ala.; Sheehan Pipe Line Construction Co., contractor. Jim Brown, Meridian, Miss., spreadman.

Southern Natural Gas Co.—34 miles, 34-in., under way, loops to Mississippi, Alabama, Georgia; Sheehan Pipe Line Construction Co., contractor. Jim Brown, R. H. Brown, spreadmen.

Southern Natural Gas Co.—85 miles, 18-in., under way, Mississippi-Alabama state line to Selma, Ala.; completion due November 15; Sheehan Pipe Line Co., contractor C. M. Brown, spreadman.

Southern Natural Gas Co.—161 miles, 16-18-in., under way, Selma, Ala., to Elmore, Ala. Associated Pipeline Contractors, Inc., contractor. Lacy Walker and L. H. Gray, spreadmen.

Southern Natural Gas Co.—110 miles, 11-in., considered, extension.

Southern Natural Gas Co.—118 miles, 13-in., planned, extension.

Southern Natural Gas Co.—138 miles, 20-22-in., planned, Chattanooga, Tenn., to Lexington, Miss.

Southern Natural Gas Co.—171 miles, 16-planned, extension.

Southern Natural Gas Co.—225 miles, 16-in., planned, Colfax, Ga., extension.

Southern Natural Gas Co.—314 miles, 18-in., planned, extension.

Southern Natural Gas Co.—375 miles, 34-in., planned, Gwinville, Miss., to Atlanta Ga.

Southern Union Gas Co.—78 miles, 8-10-14-in., planned, New Mexico loops and laterals.

Sunray Oil Corp.—133 miles, 3-30-in., system for Snyder gasoline plant, Vaughn & Taylor Construction Co., contractor. D. D. Vaughn, spreadman.

Tennessee Gas Transmission Co.—102 miles, 16-in., under way, Bayou Sale to Kinder, La.; Latex Construction Co., contractor. H. L. Leake, superintendent.

Tennessee Gas Transmission Co.—700 miles, 20-26-in., planned, Burnaugh, Ky., to Massachusetts including 400-mile line to Buffalo.

Tennessee Gas Transmission Co.—95 miles, 20-in., under way, Natchitoches to Kinder, La.; Latex Construction Co., contractor. F. A. Silar, superintendent.

Tennessee Gas Transmission Co.—992 miles, 30-in., planned, first 150 miles of loops to be laid at Monroe, La., Greenville, Miss., Midland and Portland, Tenn.

Tennessee Gas Transmission Co.—70 miles, 26-30 in., contracted, between Stations 100 and 110; Anderson Brothers Corp., contractor. E. C. McCoy and Arkie Hobson, Richmond, Ky., spreadmen.

Tennessee Gas Transmission Co.—174 miles, 30-in., under way, western Tennessee and Kentucky; Price-Morrison, contractor. Jack Hodges and R. L. McMillon, superintendents.

Tennessee Gas Transmission Co.—74 miles, 30-in., under way, from near Glasgow northeastward to near Lebanon, Ky; Morrison Construction Co., contractor. R. L. McMillon, Adamsville, Tenn., spreadman.

Tennessee Gas Transmission Co.—28 miles, 30-in., under way, near Scottsville, southwestward to near White House, Tenn.; Morrison Construction Co., contractor. R. L. McMillon, Adamsville, Tenn., spreadman.

Tennessee Gas Transmission Co.—99 miles, 30-in., under way, near Dickson, southwestward to near Selmer, Tenn.; H. C. Price, contractor. Jack Hodges, Linden, Tenn., spreadman.

Tennessee Gas Transmission Co.—170 miles, 26-30-in., contracted, Kentucky; Anderson Brothers Corp., contractor.

Texas Eastern Transmission Corp.—1,400 miles, 26-in., planned, Texas to Pittsburgh, loops.

Texas Gas Transmission Corp.—33 miles, 12-in., authorized, Slaughters, Ky., to Evansville, Ind.

Texas Gas Transmission Corp.—723 miles, 26-in., under way, Lisbon, La., to Middletown, Ohio.

Texas-Illinois Natural Gas Pipeline Co.—58 miles, 20-in., lateral from Joliet terminal to connection with Natural Gas Pipeline Co. of America near Volo, Ill.

Texas-Illinois Natural Gas Pipeline Co.—1,300 miles 30-in., under way, Corpus Christi area to Joliet, Ill.

Texas-Illinois Natural Gas Pipeline Co.—100 miles, 26-in., La Gloria to Refugio, Tex.; Midwestern Constructors, Inc., contractor of Schedule 1. M. T. Wilhite, superintendent.

Texas-Illinois Natural Gas Pipeline Co.—100 miles, 30-in., under way, Mississippi River to Effingham, Ill.; Midwestern Constructors, Inc., contractor of Schedule 11. R. C. Stanley, superintendent.

Texas-Illinois Natural Gas Pipeline Co.—100 miles, 30-in., to start in 1951, Effingham to Sibley, Ill.; Midwestern Constructors, Inc., contractor to Schedule 12.

Texas-Illinois Natural Gas Pipeline Co.—93 miles, 30-in., to start in 1951; Sibley to Joliet, Ill.; Midwestern Constructors, Inc., contractor of Schedule 13.

Texas-Illinois Gas Pipe Line Corp.—400 miles, 30-in., contracted, Arkansas and Missouri; Bechtel Corp. A. M. Berlander, general superintendent.

Texas-Illinois Gas Pipe Line Corp.—120 miles, 30-in., contracted; H. C. Price, contractor. Work under way.

Texas-Illinois Gas Pipe Line Corp.—110 miles, 30-in., contracted; H. C. Price, contractor. Work under way.

Texas-Illinois Gas Pipe Line Corp.—97 miles, 26-in., contracted; H. C. Price, contractor. Work under way.

Texas-Illinois Gas Pipe Line Corp.—30 miles, 24-in., contracted; H. C. Price, contractor. Work under way.

Texas-Illinois Gas Pipe Line Corp.—30

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miles, 12-in., contracted; H. C. Price, contractor. Work under way.

Transcontinental Gas Pipe Line Corp.—1,840 miles, 30-in., under way, Rio Grande Valley, Texas, to New York City.

Transcontinental Gas Pipe Line Corp.—80 miles, 10-14-in., underway, Mercedes to south of Falfurrias, Tex.; Massey Construction Co., contractor of Schedule A.

Transcontinental Gas Pipe Line Corp.—108 miles, 24-in., under way, south af Falfurrias to Edna, Tex.; H. B. Zachry Co., contractor of Schedule B.

Transcontinental Gas Pipe Line Corp.—93 miles, 30-in., under way, Porters to Deweyville, Tex.; Texas Southern Contracting Co., contractor of Schedule D. Merle Tatum, Liberty, Tex., spreadman.

Transcontinental Gas Pipe Line Corp.—81 miles, 30-in., under way, Sabine River, to Eunice, La.; Anderson Bros. Corp., contractor of Schedule E.

Transcontinental Gas Pipe Line Corp.—100 miles, 30-in., under way, Catawba River, North Carolina, to North Carolina-Virginia boundary; R. H. Fulton & Co., contractor of Section 9. A. A. Corrigan and Clark Williams, superintendents.

Transcontinental Gas Pipe Line Corp.—86 miles, 30-in., under way, North Carolina-Virginia boundary to James River, Virginia; O. R. Smith Contracting Corp., contractor of Section 10. R. M. Jones, Altavista, Va., spreadman.

Transcontinental Gas Pipe Line Corp.—110 miles, 30-in., under way, James River, Virginia, to Potomac River, Virginia; O. R. Smith Contracting Corp., contractor of Section 11. C. C. Craig, Herndon, Va., spreadman.

Transcontinental Gas Pipe Line Corp.—75 miles, 30-in., contracted, Potomac River to Susquehanna River; Associated Pipe Line Contracting, Inc., contractor of Section 12. Cecil Rogers, Towson, Md., spreadman.

Transcontinental Gas Pipe Line Corp.—90 miles, 30-in., contracted, Susquehanna Pa., to Delaware River; Wunderlich & Griffis Construction Co., contractor of Section 13.

Transcontinental Gas Pipe Line Corp.—61 miles, 30-in., contracted, Delaware River to Hackensack River, New Jersey; Wunderlich & Griffis Construction Co., contractor of Section 14.

Transcontinental Gas Pipe Line Corp.—23 miles, 30-in., under way, Edgewater to Elizabeth, N. J.; Oklahoma Contracting Co., contractor to Schedule 15. Louis Visentine, Edgewater, N. J., superintendent.

Transcontinental Gas Pipe Line Corp.—98 miles, 6-14-in., under way, Wharton, Tex., area; Altgelt Construction Co., contractor, Texas Unit 1.

Transcontinental Gas Pipe Line Corp.—58 miles, 4-14-in., under way, El Campo, Tex., area; T & R Construction Co., contractor, Texas Unit 1.

Transcontinental Gas Pipe Line Corp.—38 miles, 4-8-in., under way, Sinton, Tex., area, Shanks & Eustace, Inc., contractor, Texas Unit 2.

Transcontinental Gas Pipe Line Corp.—61 miles, 6-10-in., under way, Dix, Tex., area; Victoria Oil Field Maintenance Co., contractor, Texas Unit 2.

Transcontinental Gas Pipe Line Corp.—50 miles, 18-20-in., under way, Eunice, La., to the south; Texas Southern Contracting Co., contractor, Texas Unit 2. Jim Reed, Crowley, La., spreadman.

Transcontinental Gas Pipe Line Corp.—380 miles, 8-16-in., planned, laterals to gas field.

Transcontinental Gas Pipe Line Corp.—85 miles, 4-14-in., under way, South Louisiana; Latex Construction Co., contractor. J. B. Latham, Vinton, La., spreadman.

Transcontinental Gas Pipe Line Corp.—78 miles, 30-in., contracted, Delaware River to southwest; Ray L. Smith & Son, Inc., contractor. Joe L. Work, Newton, Pa., spreadman.

Trunkline Gas Co.—278 miles, 20-in., contracted, Valley of Texas; R. H. Fulton & Co., contractor.

Trunkline Gas Co.—18 miles, 26-in., contracted, Mississippi, Tennessee, and Kentucky; R. H. Fulton & Co., contractor.

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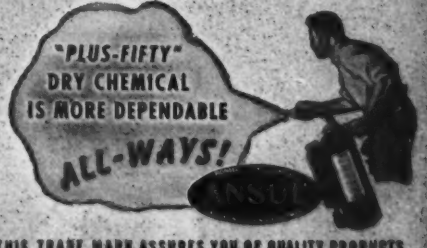

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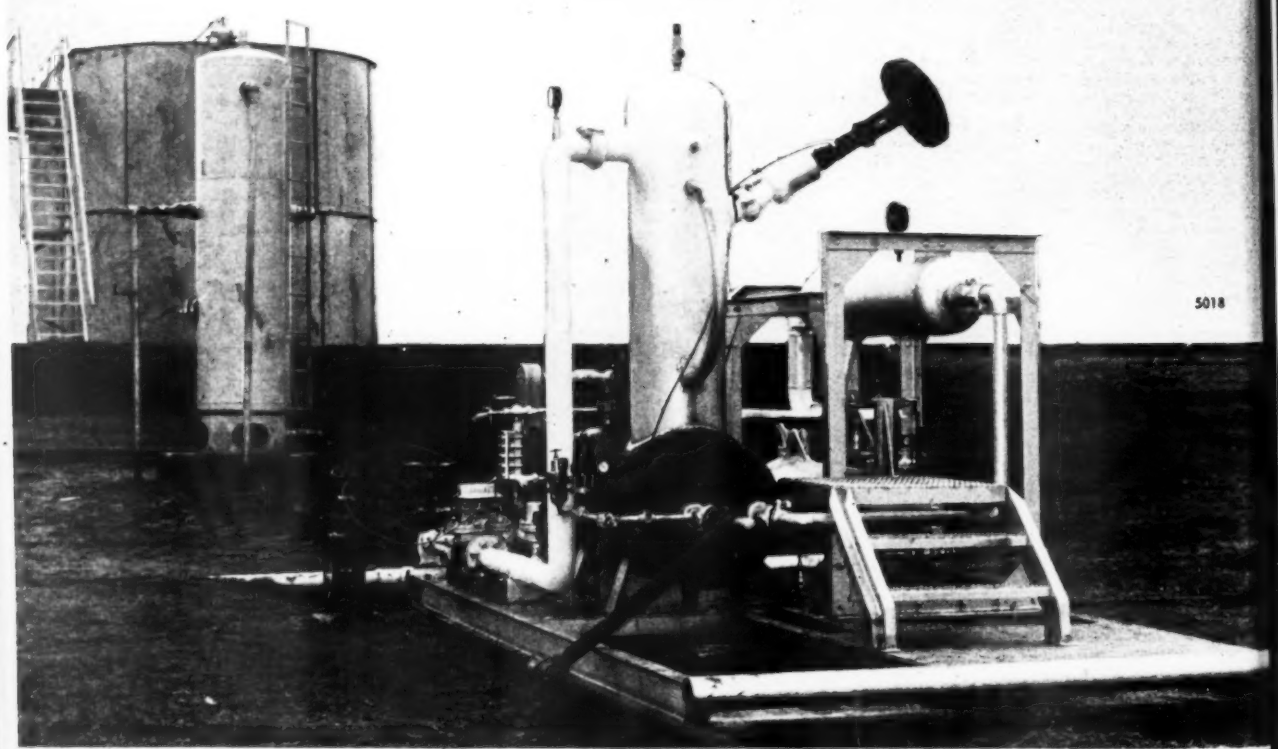

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Illinois Volume Upped

WASHINGTON.—Texas Illinois Natural Gas Pipeline Co., Chicago, has been authorized by the Federal Power Commission to increase the daily capacity of its natural-gas transmission system from 312,625,000 cu. ft. daily to 383,350,000 cu. ft.

The ruling authorizes Texas Illinois to sell the additional gas to some of its presently authorized customers, reserving 7,705,000 cu. ft. daily for prospective customers.

Present customers who will receive additional service are Natural Gas Pipeline of America, Public Service Co. of Northern Illinois, Northern Indiana Public Service Co., Peoples Gas Light & Coke Co., and Western United Gas & Electric Co. Distributing companies along the pipe-line route entitled to larger daily supply are Allied Gas Co.-Paxton Division; Monarch Gas Co.-St. Elmo and Brownstown; and Union Gas & Electric Co.-Bloomington.

5-Year Research Planned

WASHINGTON.—A 5-year $250,000 petrochemical-research program to be conducted jointly by Electric Bond & Share Co., United Gas Corp., a subsidiary, and the National Research Corp., Cambridge, Mass., has been approved conditionally by the Securities and Exchange Commission.

Under a contract submitted to the SEC, Bond & Share and United Gas will contribute equally to the costs of studies to develop new processes or products based on the use of natural gas, and will each receive a 40 per cent participation in any results which can be exploited commercially, the remaining 20 per cent going to National Research Corp.

Bond & Share has pending before the commission an application to be relieved of its commitment to dispose of its holdings of 27 per cent of the outstanding common stock of United Gas which it acquired following the liquidation and dissolution of Electric Power & Light Corp., another subsidiary. The approval of the research contract is subject to a condition that, in the event the application is denied and it is not relieved of its commitment the company will immediately withdraw from and terminate all interest in the research program.

Storage Areas Sought

CHICAGO.—Drilling has started in Kankakee County as part of the intensive effort to locate underground-storage reservoirs that are the key to this area's natural-gas supply. Both the Texas Illinois Natural Gas Pipeline Co. and Peoples Gas Light & Coke Co. have joined in the search, seeking to have the storage caverns in readiness when the first natural gas arrives about November 1 next year.

James F. Oates, Jr., chairman of Peoples, reported his company was exploring the possibility of underground storage either in artificially created limestone caves or in porous sandstone located far below the surface. The sandstone potential lying beneath a dome-shaped stratum of rock is considered the more promising. The feasibility of mining limestone in vast quantities to develop space is still in the research stage.

Acuteness of the situation lies in high cost of natural gas that will be involved if this area has to rely entirely on pipe-line capacity and is unable to build up reserves underground that can be tapped when the peak winter demand arrives. New pipe lines are considered a costly way of providing natural gas for space heating because only a 25 per cent load factor is involved. Peoples has a reported waiting list of 90,000 customers.

Short Course Planned

General and executive committees of the Southwestern Gas Measurement Short Course, to be held at the University of Oklahoma, Norman, Okla., April 10-12, 1951, have outlined plans for the session.

The program has been arranged to cover all phases of gas-measurement work including gas accounting, metering, and pressure regulations. It will be under the direction of James L. Griffin, Northern Natural Gas Co., Omaha.

New members elected to the general committee are Gordon B. Gudger, Gulf Refining Co., Houston, representing the South Texas area and replacing W. H. Woods, Gulf Oil Corp., Houston, who served as general chairman for the 1950 short course; C. A. Breitung, gas supervisor of the Railroad Commission of Texas; and Elmer Capshaw, gas engineer of the Oklahoma Corporation Commission.

Sales Revenues Increase

NEW YORK.—Total revenues from natural-gas sales during the third quarter of 1950 were $229,000,000, a rise of 23.2 per cent over the comparable quarter of 1949. For the 12 months ended September 30, revenues from natural-gas sales were $1,281,000,000, an increase of 20.6 per cent over 1949 when revenues were $1,062,000,000.

Sales of natural gas during the third quarter totaled 741,000,000 M.c.f., an increase of 18.7 per cent over the like quarter of 1949. For the year ended September 30, sales were 3,533,000,000 M.c.f., a gain of 15.9 per cent over the volume for the like period a year earlier.

At the end of September, about 14,500,000 customers were being served with natural gas, an increase of 15.3 per cent over the previous year. Approximately 800,000 of this increase is attributed by the American Gas Association to changeover from manufactured gas to natural gas in Baltimore, St. Louis, Milwaukee, and Louisville.

Impounded Funds Freed

WASHINGTON.—Natural-gas customers of Mississippi River Fuel Co. will share in impounded funds amounting to approximately $1,500,000. The fund stems from overpayments made by Mississippi to its supplier of natural gas, Interstate Natural Gas Co.

When the high court refused to review the case, distribution of the funds became operative. Utility customers will receive about $545,000, and Mississippi will keep for itself an estimated $939,600. The impounded funds were involved in a rate dispute covering the 1943-47 period.

Property Sale Approved

WASHINGTON.—Hope Natural Gas Co., Clarksburg, W. Va., has been authorized by the Federal Power Commission to acquire the natural-gas production, storage, transmission, distribution, and sales system of Monongahela Power Co., Fairmont, W. Va.

By the sale, Monogahela will withdraw from the natural-gas business, confining its operations to that of an electric public utility. The properties involved are located in Marion, Monongalia, Harrison, and Wetzel counties, West Virginia.

The transaction is estimated to involve approximately $2,369,351, and is designed to provide a more reliable natural-gas service to Monongahela's customers through integration of its system into that of Hope's.

Monongahela is a subsidiary of West Penn Electric Co. Hope is a subsidiary of Consolidated Natural Gas Co. At present, Monongahela furnishes natural gas to its wholly owned subsidiary, State Line Gas Co., Point Marion, Pa.

Arrangements are now in process for Peoples Natural Gas Co., an affiliate of Hope, to acquire State Line's natural-gas system in Pennsylvania.

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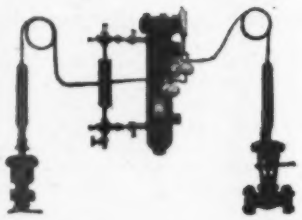

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REFINING

Atlantic Expansion

Firm to enlarge refining, petrochemical operations

NEW YORK.—Atlantic Refining Co. is now in various stages of plans for expanding refining and petrochemical operations on three major fronts.

Speaking before the New York Society of Security Analysts, Atlantic's executive vice president, Henderson Supplee, Jr., revealed that the company is now considering the addition of 40,000 bbl. per day in refinery capacity. Whether the new facilities will be added to either or both of the two existing plants at Philadelphia and Port Arthur, or whether they will comprise a third refinery, was not revealed. Atlantic's Point Breeze refinery at Philadelphia is rated at 117,500 bbl. per day, and the Atreco plant near Port Arthur has a capacity for 47,500 bbl.

Supplee reported that about $55,000,000 has been budgeted for the refining department over the next 5 years. Over-all capital expenditures for the next few years will range between 50 and 60 million dollars annually, he said, with about 27 million dollars to be withdrawn from reserve each year and the remainder coming from earnings.

Reforming process. — Engineers at the company's research laboratories at Philadelphia are now designing a commercial plant to employ the new catalytic reforming process developed in the same laboratories. A third project of major importance concerns the company's chemical-products section which recently announced a 3 to 4-million-dollar program for expanding the manufacture of synthetic detergents. This will entail enlargement of existing facilities at Philadelphia and erection of a new plant at Port Arthur.

Investment Increase Sought

WASHINGTON.—United Gas Corp., Shreveport, La., has applied to the Securities and Exchange Commission for permission to increase its investment in Carthage Hydrocol, Inc., Brownsville, Tex., by $415,090 by the purchase of 41.2 units, each consisting of a $10,000 preferred 6 per cent promissory note and 75 shares of common stock, par value. United already owns $227,250 of preferred notes, $1,950,000 of other notes and 16,323 shares of Hydrocol common stock.

Hydrocol has completed construction of its plant for the production of gasoline from natural gas at a cost of approximately $40,000,000, against an original estimate of $14,000,000, which was financed, together with funds for working capital and other purposes, by a Reconstruction Finance Corp. loan of $18,000,000 and the issuance thus far of $18,237,500 6 per cent promissory notes due October 1, 1960, $1,262,500 of preferred 6 per cent promissory notes due on the same date, and 178,125 shares of common stock.

The company now is offering subscriptions to 300 additional units, consisting in the aggregate of $3,000,000 principal amount of 6 per cent notes and 22,500 shares of common stock, to present holders of notes and stock on the basis of their respective holdings. On this basis, United is entitled to subscribe for 33.5 units, but because of the failure of certain stockholders to exercise their subscription rights proposes to take a larger amount.

Hydrocol proposes to use $626,875 of the proceeds from the proposed sale to restore working capital to $1,500,000 so that $500,000 remaining of the RFC loan commitment can be taken down; $595,000 to provide funds for additional capital expenditures, and $1,500,000 to provide for monthly overhead expenses of the last 4 months of this year.

Diesel-Fuel Survey

The first of an annual series of diesel-fuel surveys has just been released by the U. S. Bureau of Mines. Prepared in cooperation with the American Petroleum Institute, the annual survey was instituted to consolidate comparable data on the types and quality of such fuels currently marketed in this country.

In the current survey, 56 refiners have cooperated in making analyses of samples representing actual fuel shipments. Altogether, 266 samples were subjected to 14 separate tests employing approved standard-test procedures. The results were submitted to the Bureau of Mines for study and compilation.

Data are tabulated in two arrangements. Analyses are first classed according to end use: (1) for city buses and similar service; (2) for diesel engines in trucks, tractors, and similar equipment; (3) for railroad diesel engines, and (4) heavy-distillate and residual fuels for large stationary and marine diesels. Each of these classes shows subdivisions of fuel analyses for various seasons.

The second arrangement is made according to A.S.T.M. grades; (1-D) diesel fuels of 625° F. maximum end point; (2-D, first section), diesel fuels of 675° F. 90 per cent point, with pour

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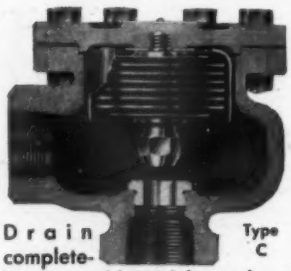

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points below 0° F.; (2-D, second section), diesel fuels of the same 90 per cent point with pour points above 0° F.; and (4-D) diesel fuels not conforming to the foregoing limitations.

The new report entitled "National Annual Diesel-Fuel Survey, 1950" is designated as B. M. Report of Investigations 4746, obtainable from the Bureau of Mines Publication Distribution Section, 4800 Forbes Street, Pittsburgh 13.

Tax Revenues Increase

WASHINGTON.—Treasury revenues from the three federal oil taxes will run in the neighborhood of $650,000,000 this year, about $50,000,000 above 1949, it is indicated by collections for the first 10 months.

The Internal Revenue Bureau reported last week that 10-month receipts included $452,309,196 from gasoline against $414,111,588 last year, $74,656,340 from lubricating oils against $69,244,679, and $16,819,927 from pipe-line transportation against $15,454,549.

Collections for October included $46,924,466 from gasoline against $49,320,824 for the corresponding period last year, $12,638,008 from lubricating oils against $7,163,260, and $1,817,135 from pipe-line transportation against $1,286,669, the bureau stated.

Refineries Prosper

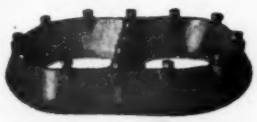
WASHINGTON. — Refining corporations reported dividends totaling $141,500,000 in September, establishing a trend in the oil industry. In the same month last year, dividends were $83,900,000, giving the figure for 1950 an improvement of 68.7 per cent.

The September distribution brought refinery dividends for the quarter to $171,700,000 compared with $132,500,000 last year, as reported by the Department of Commerce. This was the next highest total in the manufacturing field, being exceeded only by the automobile industry.

The improved dividend report is interpreted as being an indication that most of the industry's postwar expansion projects have been completed. Increased payments were fairly well divided between major and independent companies. Four companies made dividend payments in the third quarter that did not declare a year ago.

Gulf Buys Detroit Outlet

All of the physical assets in the Detroit area, owned by Sohio-Fleetwing, Inc., a wholly owned subsidiary of Standard Oil Co. (Ohio), have been purchased by Gulf Refining Co. The purchase includes a number of service-station properties and the assignment of lease-hold rights in other retail stations.



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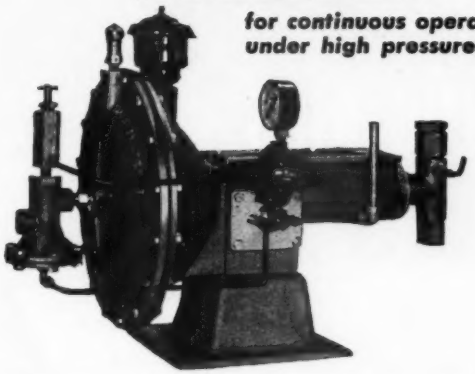

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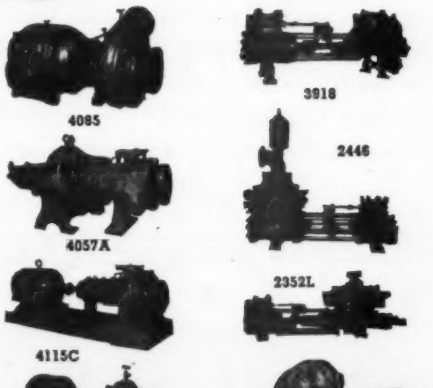

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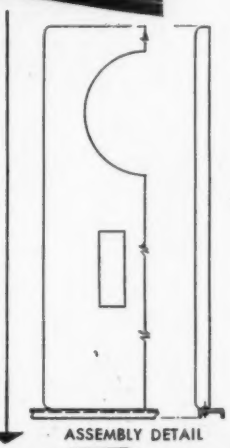

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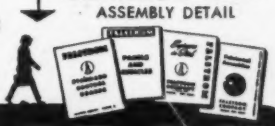

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Among the Drilling Contractors

Kansas Contractors Pick Adkins for New Chairman

The Kansas chapter of the American Association of Oilwell Drilling Contractors has elected James G. Adkins, president of Adkins Drilling Co., Great Bend, as its chairman for the ensuing year. He succeeds Charles H. Todd, president of Rine Drilling Co., Wichita.

Other new officers elected are: E. L. McCartney, coowner, B & R Drilling Co., Inc., and William S. Brunson, Brunson Drilling Co., both of Wichita, vice chairmen; and J. D. Ferrell, Ferrell Drilling Co., Great Bend, secretary.

Gibson Drilling Co., Los Angeles, is drilling for Coast Exploration Co. at 1 Dotta, a wildcat in the Chatsworth area, Los Angeles County, California. Location is in 19-2n-16w, 1½ miles southeast of the town.

Delta Drilling Co., Tyler, Tex., has a rig running in the Opelika field, Henderson County, Texas, for Lone Star Producing Co. Current operation is at 1 Tedford, in the A. Anglin Survey.

Contracts for two additional wells which Skelly Oil Co. is undertaking in the Athens field, Claiborne Parish, Louisiana, have been given to **J. I. Roberts** and **Wheless Drilling Co.,** Shreveport. The former will drill 1 Willa Jameison, in 25-20n-7w, while the latter will be on 1-B Dick, C SE NW 28-20n-6w.

Western Drilling Co., Longview, Tex., is moving a rotary rig to a location a mile northeast of the Parks field, Scurry County, West Texas, where it will drill a 7,500-ft. Strawn zone test for V. A. Brill. Location is for 1 Josephine Woodward in Section 443, Block 97, H&TC Survey.

Arrow Drilling Co., Dallas and Tulsa, has the contract and is moving in to deepen Union Producing Co. 1-B W. T. Music, C NW NE 26-10n-21w, on the south flank of the Elk City field in Beckham County, western Oklahoma. Hole previously had been drilled to 10,556 ft. where it was temporarily abandoned in August 1949. The new contract calls for a total depth of 13,500 ft.

Gene Reid Drilling Co., Inc., Bakersfield, Calif., is starting a wildcat test for William R. Whittaker Co., Ltd., in the Carrizon Plains area, Kern County. Location for the test, 1 Marita, is 31-28s-19e.

Dorris Ballew, Inc., Natchez, Miss. is drilling a 6,500-ft. wildcat test 2 miles north of the Deer Park field, Concordia Parish, Louisiana. Contract is with Barnett Serio. The test is 1 Junkin. Location is in 52-5n-9e.

Lee Brown Drilling Co., Fort Worth, has a contract for an 8,000-ft. Spraberry wildcat test to be drilled for Plymouth Oil Co. at 1 Jeff Davis, located 2½ miles east of Stanton, southeast Martin County, Texas. The casing program will be designed to permit deepening the hole to the Ellenburger.

Delaware Drillers, Inc., San Angelo, Tex., has the contract on Hiawatha Oil & Gas Co. 1 Runge, a Canyon reef exploratory test located in Section 66-M, GH&SA Survey, 3½ miles northeast of Hulldale, Schleicher County, Texas. Hole is projected to 6,500 ft.

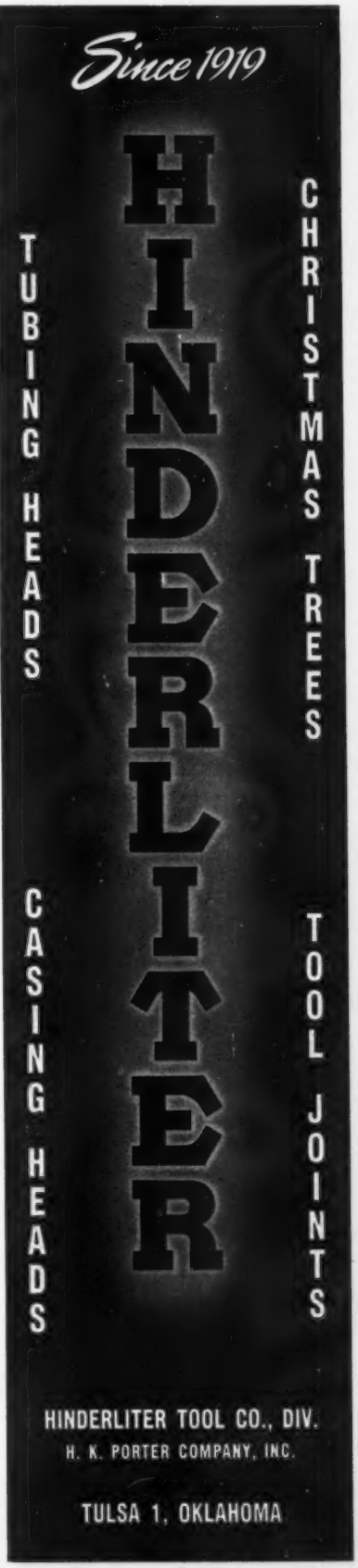
Luke Grace, Wichita Falls, has contracted to drill another 5,000-ft. wildcat test for Warren Oil Co. It will be 1 West Hamilton, with location in Section 1,651, TE&L Survey, 6 miles northeast of Woodson, Throckmorton County, Texas.

Empire Drilling Co., Dallas, has the drilling contract and an interest in Aurora Gasoline Co. 1 Kent, a 5,000-ft. Strawn test being started in Section 197, Block 11, SPRR Survey, 2 miles east of production in the Susan Peak field, Tom Green County, Texas.

Standard-Fryer Drilling Co., Dallas, is drilling at Ted Weiner 1-16 Driver, a Spraberry exploratory test in southeastern Midland County, West Texas. Location is in Section 16, Block 37-4s, T&P Survey, 7 miles south of the Tex Harvey Spraberry field. Hole is projected to 8,500 ft.

K. & E. Drilling Co., Wichita, will drill for National Associated Petroleum Co. at 1 State, a wildcat in southern Harlan County, Nebraska. Location is in the SW SW SW 16-1n-19w, just across the state line from Phillips County, Kansas.

Harbar Drilling Co., Wichita, has taken a contract for a rank wildcat test to be drilled for Transwestern Oil Corp. of Philadelphia in Ford County, southwestern Kansas. The



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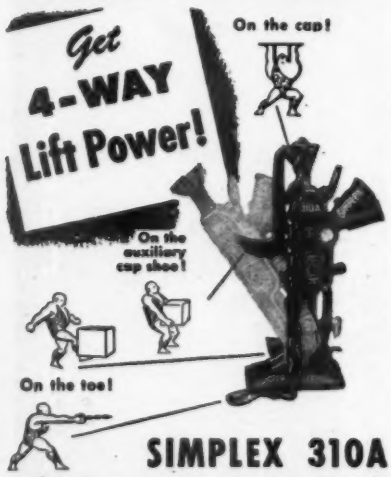

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test is 1 Hines. Location is in the SE SE SW 5-25-22, 3 miles north of Spearville. Nearest production is the Pleasant Valley pool, 20 miles to the southeast.

Thompson Drilling Co., Cushing, Okla., is drilling a second well in the producing area opened by B. B. Blair of Tulsa in the Mannford district, Creek County, Oklahoma. It is 1 Leonard, NE SE NE 33-18n-9e, an offset to 2 Thompson, the discovery well, completed in Dutcher sand at 2,804-10 ft.

W. C. Patton, Stillwater, Okla., is the contractor on a projected 5,000-ft. wildcat test which Clark & Cowden Drilling Corp. of Dallas is starting in western Payne County, Oklahoma. The test is 1 Hunt, SW NW SW 27-19n-1w.

Brinkerhoff Drilling Co., Casper, Wyo., and Dallas, will drill a 12,000-ft. wildcat test in southwestern Reeves County, Texas, for Miami Operators, Inc., of Ballinger, Tex. Location is in Section 84, Block 13, H&GN Survey, on the Balmorhea ranch, 3 miles south of the town of Balmorhea.

W. B. Hinton, Dallas, is the contractor and holds an interest in a projected 5,500-ft. Paluxy wildcat test, 1 Justiss, which Ralph Spence is starting in the area 8 miles north of Mount Pleasant, in Titus County, northeastern Texas.

Luke Grace, Wichita Falls, has a rig working for Warren Oil Co. at a wildcat location in Section 1651, TE&L Survey, 6 miles northeast of Woodson, Throckmorton County, Texas. Name of the test is 1 West Hamilton. Contract is for 5,000 ft.

Wolfe Drilling Co., Tulsa, has moved a rotary rig to a wildcat location 5 miles west and 3 miles north of Lovell, Kingfisher County, Oklahoma, where it will drill a 7,100-ft. test for National Associated Petroleum Co. The test is 1-A Hickey. Location is in the NW NW NW 33-19n-5w.

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

Area—	Week ended 12-4-50	Change week ended 11-27-50	Change week ended 12-5-49
Gulf Coast	586	+ 1	+ 69
W. Tex.-N. M.	788	—16	+ 89
Ark.-N. La.-E. Tex.	156	— 7	— 5
Oklahoma	296	+15	+ 39
Kansas-Nebraska	160	+ 4	+ 16
Illinois-Eastern	135	+10	— 16
Rocky Mountains	118	— 9	+ 22
Pacific Coast	136	0	— 5
Total U. S.	2,375	— 2	+209
Western Canada	108	— 5	+ 21
Total	2,483	— 7	+230

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States as a whole and the Gulf Coast and Arkansas-North Louisiana-East Texas areas are shown by charts on pages 156 and 157.

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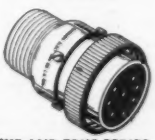

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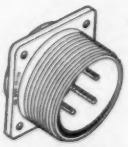

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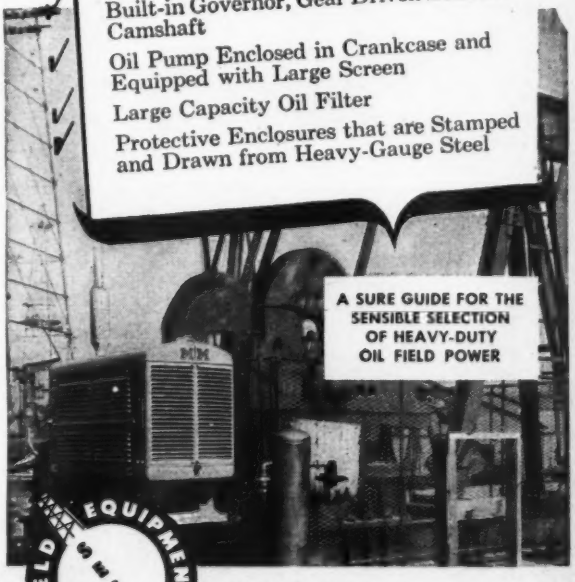

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XUM

Wildcats Attack Beckham Area Puzzle

BECKHAM County, which is in the first tier of Oklahoma counties east of the Texas Panhandle, has five wildcats at work and appears destined for an expanded wildcatting program that should soon reveal the true worth of this geologically complicated and once-condemned area.

One of the current wildcats, Carter Oil Co. et al 1 State-Taylor, SW SW 31-9n-21w, was just getting started on a 9,500-ft. test of what is considered one of the best prospects in western Oklahoma, when a well-stained core at about 3,000 ft. called for a drill-stem test. Gas hit the surface in 3 minutes at a rate of 75,000 cu. ft. daily and after a 70-minute test, the pipe unloaded over 2,000 ft. of clean 41.7°-gravity oil. The tested interval (2,951-3,005 ft.) is in the "granite wash" of Pennsylvanian age. Tests of two equal intervals between 3,000 and 3,054 ft. indicated the presence of salt water and tighter formation. This shallow discovery well is on a 6,000-acre unit.

The 1 State-Taylor lies about 8 miles south of the rapidly developing and in many ways puzzling Elk City field of Beckham and Washita counties. Granite wash production at Elk City was discovered in November 1947 by Shell Oil Co. 1 Walters, on a seismic prospect in an area of fair reflections. However, the full significance of this discovery was not generally recognized until near the end of the following year when Union Producing Co. 1 Music, approximately 2 miles southeast of Shell's well, also found production in the arkosic Pennsylvanian sandstone. The field now has over 100 wells producing from numerous intervals throughout a section from 8,800 to 10,500 ft., which has been shown to be a single reservoir.

About 1 mile northwest of the 1 State-Taylor is a dry hole completed in 1943 that found shows of oil throughout a section of Pennsylvanian sediments from the top of the Cisco at 3,160 ft. down to around 8,035 ft., top of the Mississippian - Woodford. Pipe was set on this well but commercial production was not developed. Carter's well is believed to be running 200-300 ft. higher than this old dry hole pending determinations from an electrical survey now being made.

The 1 State-Taylor, like Elk City, is on a seismic prospect. However, unlike Elk City, this new discovery lies in an area where seismic results are poor and extremely difficult to interpret. The seismic anomaly developed was convincing enough to warrant a test, but ultimate configuration of the trap remains to be determined by drilling.

Carter is starting another wildcat (scheduled depth 10,000 ft.), 32-12n-24w, about 25 miles northwest of the 1 State-Taylor on a line parallel to the trend developed by Elk City field. Other wildcats in the area are: A. A. Cameron and G. R. Scott 1 State, 36-11n-22w, just northwest of Elk City field, now drilling below 10,500 ft., which did not recover any oil in two drill-stem tests run after reaching 10,000 ft.; United Carbon Co. 1 Clark Unit, 32-12n-21w, almost a mile north of Elk City field, which is at 3,880 ft.; H. B. & G. Drilling Co. 1 Hawkins, 25-9n-23w, in the old Sayre gas area about a mile west of Carter 1 State-Taylor, which had shows of oil and gas above present depth of 2,678 ft.; and, in Roger Mills County, just north of the Beckham County line, on the trend set by Elk City field, W. A. Delaney, Jr., 1 Ewton, 17-11n-23w, which is being started.

It is conceivable that the not-too-distant future may see two long lines of oil fields paralleling the Wichita-Amarillo uplift, one on the north flank of the mountains and the other out from the mountains about 10 miles. There is evidence of compression faulting along the Wichita Mountain front which may control traps in the granite wash. Elk City lies out in the Anadarko basin on what some geologists believe is an arch, probably older than the Wichita-Amarillo uplift, that runs northwest across the Texas Panhandle into Colorado. This arch, known as the Apishapa arch in Colorado, may control the structural accumulations at Lips and Willclo in Rogers and Sherman counties, Texas.

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Continental Oil Co. 2 Swenson, Garza County wildcat, was drilling ahead to the Ellenburger. Drill-stem test at 6,851-87 ft. found additional pay and operators reversed out 90 ft. of oil-cut mud, 1,620 ft. of 33°-gravity oil, and some salty drilling mud. Magnolia Petroleum Co. completed its 1 Timmerman, Midland County Pennsylvanian discovery, for 400 bbl. of oil, flowing through 28/64-in. choke. Completion was without acid. Earlier in the week the well flowed 21.6 bbl. of new oil in 30 minutes through ½-in. choke. Second well for Spires Strawn field, Kent County, completed on the pump for 149.22 bbl. of 36°-gravity oil a day, and extended the field 1½ miles northwest. Half mile south of the Spires discovery, Sunray and Seaboard's 2 Spires, dry in the Strawn at 6,880 ft., was dry in the Mississippian after being reentered and drilled to 7,375 ft.

ROCKY MOUNTAIN AREA.—Shows of gas were found at General Petroleum Corp.'s wildcat at San Rafael River (Emery County), and California Co.'s Red Wash (Uintah County), Utah, wildcats. Standard of California and Continental Oil Co. have spudded a new Nevada wildcat. British-American Oil Producing Co.'s well in the Mount Hope area, Logan County, Colorado, flowed 226 bbl. of oil daily following Hydrafrac treatment. (For details, see field report this week.)

MARYLAND.—Increasing activity continues around the recently opened Mountain Lake Park gas field in Garrett County, with eight wells either drilling or in various other stages of operation. Latest new location is Eberly & Snee 1 R. L. Gilbert, less than a mile southwest of the Welch discovery well.

XUM

Kansas

Phillips County Wildcat Showing for Production

SWABBING tests by Imperial Petroleum Co. in its 1 Vogel, SE SE NE 14-3-19, Phillips County, have virtually assured the opening of another pool in the extreme northern part of the state at the upper end of the Central Kansas Uplift. During one 4-hour period, the well swabbed at the rate of 20 bbl. of oil per hour from a depth of 500 ft. off bottom. Production is from Lansing lime, topped at 3,128 ft. (—1,115 ft.). Total depth is 3,150 ft. with casing at 3,146 ft.

In northeastern Stafford County, Pickrell Drilling Co. has good prospects for production in its 1 Duggan, NE SW SW 30-21-11, where casing has been run to test oil showings found in a conglomerate zone, topped at 3,468 ft. (—1,683 ft.). A 15-minute drill-stem test at 3,460-90 ft. yielded 1,740 ft. of oil in the breakdown. Since the drill-stem test, hole has been deepened to the Arbuckle, logged at 3,545-52 ft., and in which casing has been run to 3,548 ft. The well had the Lansing at 3,190 ft. (—1,405 ft.). The location is ¾ mile south of the Sand Hills pool, but is separated from that pool by a dry hole.

National Associated Petroleum Co. 1 Harris, NE NE SW 30-19-12, 3 miles east of Great Bend, in Barton County, swabbed at the rate of 20 bbl. of oil per hour while cleaning out and testing Arbuckle lime, open at 3,395-99 ft. Top of the pay is 3,392 ft. (—1,566 ft.). Nearest production is in the North Hammer pool, 3½ miles to the east. The well also is a prospective producer in the Lansing-Kansas City section, topped at 3,134 ft., and in which a drill-stem test, previously reported, at 3,157-67 ft. yielded 1,000 ft. of oil.

Peel & Hardman have completed their 1 Waltz, SE SE SW 12-11-21, northeastern Trego County, to establish a new pool in the area 3 miles northwest of the Nicholson pool (Ellis County). The well pumped 397 bbl. of oil per day on potential test. Production is from Arbuckle lime, open at 3,666-80 ft. (surface elevation 2,094 ft.). Pay was topped at 3,665 ft.

Nadel & Gussman 1 Moffett, NE NE SE 8-30-15, 2 miles north of the Turkey Creek pool, nearest production, in the northwest corner of Barber County, swabbed at the rate of 6 bbl. of oil per hour while starting tests of Viola lime, in which casing was perforated at 4,650-60 ft. Pay zone was not acidized Hole was drilled to a total depth of 4,871 ft. in Arbuckle, topped at 4,845 ft. No shows were found below the Viola and casing was run only to 4,690 ft. Viola was topped at 4,620 (—2,664 ft.).

KANSAS SUCCESSFUL WILDCATS

Barber County: Continental Oil Co. 1 Cavin, SW SW NW 29-33s-11w, elev. 1,407 ft., pumped 36 bbl. of oil per day from Mississippian at 4,583-95 ft., TD 4,618 ft., Lansing-Kansas City 3,833 ft., Mississippi lime 4,507 ft.

Barton County: Aladdin-Crowe 1 Habiger, SW SW NW 1-19s-12w, elev. 1,828 ft., pumped 118 bbl. of oil per day from Lansing at 3,116-26 ft., 3,170-78 ft., and 3,186-92 ft., TD 3,430 ft., anhydrite 644 ft., Topeka 2,938 ft., Lansing-Kansas City 3,128 ft., Sooy 3,387 ft., Arbuckle 3,414 ft.

Ford County: Clay 1 Bierney, C SW NE 2-28s-21w, elev. 2,336 ft., 12,000,000 cu. ft. of gas from Mississippian at 3,954-86 ft., TD 5,045 ft., Kansas City 4,291 ft., Mississippi lime 4,928 ft.

McPherson County: Glickman 1 State, NE NE NE 21-18s-1w, elev. 1,431 ft., pumped 40 bbl. of oil per day from Mississippian at 2,762-2,774 ft., TD; Mississippi lime 2,750 ft., Mississippi dolomite 2,761 ft.

Stafford County: Derby 1 Johnson, NE NE NW 17-21s-12w, elev. 1,853 ft., pumped 10 bbl. of oil per day from Lansing at 3,305-13 ft., 3,356-64 ft., and 3,393-3,406 ft., anhydrite 665 ft., Heebner 3,091 ft., lime 3,218 ft., Lansing-Kansas City 3,234 ft., Sooy 3,451 ft., Arbuckle 3,487 ft.

KANSAS WILDCAT FAILURES

Barton County: Davis-Child 1 Schermuly, SW SW SW 18-20s-12w, elev. 1,852 ft., dry, TD 3,517 ft., anhydrite 650 ft., lime 3,190 ft., Lansing-Kansas City 3,203 ft., Sooy 3,445 ft., Arbuckle 3,476 ft.

Bay and B & R 1 Straub "A," SW SW NW 20-18s-11w, elev. 1,820 ft., dry, TD 3,467 ft., anhydrite 660 ft., Howard 2,649 ft., Topeka 2,730 ft., Heebner 2,992 ft., lime 3,100 ft., Lansing-Kansas City 3,119 ft., Sooy 3,381 ft., Arbuckle 3,415 ft.

Lynn 1 Koester, SW SE NE 28-17s-12w, elev. 1,939 ft., dry, TD 3,510 ft., anhydrite 825 ft., Heebner 3,100 ft., lime 3,200 ft., Lansing-Kansas City 3,213 ft., Arbuckle 3,213 ft., Arbuckle 3,466 ft.

Butler County: Artnell 1 Jahren, NE NW NW 29-25s-8e, elev. 1,500 ft., dry, TD 2,755 ft., Lansing 1,638 ft., Kansas City 1,830 ft., Cattleman sand 2,389 ft., Bartlesville 2,576 ft., Mississippi lime 2,657 ft.

Ellis County: Continental 1 Breit, NE SE NW 33-15s-17w, elev. 1,870 ft., dry, TD 3,627 ft., Lansing-Kansas City 3,181 ft., Arbuckle 3,521 ft.

Graham County: Wood River 1 Callison, NE NE SW 29-10s-22w, elev. 2,343 ft., dry, TD 4,112 ft., anhydrite 1,844 (?) ft., Heebner 3,583 ft., Lansing-Kansas City 3,617 ft., Arbuckle 4,087 ft.

Gore 1 Legere, NE SE NW 15-8s-23w, elev. 2,151 ft., dry, TD 3,915 ft., Topeka 3,134 ft., Heebner 3,384 ft., Lansing-Kansas City 3,421 ft., Sooy 3,768 ft., Arbuckle 3,885 ft.

Morris County: Adkinson et al 1 Andrews, SW SW NW 31-16s-6e, elev. 1,428 ft., dry, TD 2,207 ft., Mississippi lime 2,142 ft.

Fall River 1 Rindt, SE SE NE 22-16s-5e, dry, TD 2,260 ft., Mississippi lime 2,214 ft.

Nemaha County: Stephens 1 Maelzor, NW NW SW 26-2s-14e, Strahm area, elev. 1,274 (?) ft., dry, TD 3,612 ft., Lansing-Kansas City 1,297 ft., Mississippi chat 2,454 ft., Mississippi lime 2,458 ft., Kinderhook 2,614 ft., Hunton 2,871 ft., Maquoketa 3,532 ft., Viola 3,586 ft.

Pratt County: Cities Service 1 Blackwelder, SE NE SE 18-29s-11w, elev. 1,839 ft., dry, TD 4,700 ft., Topeka 3,281 ft., Douglas 3,778 ft., lime 3,817 ft., Lansing-Kansas City 3,840 ft., Sooy 4,295 ft., Kinderhook 4,268 ft., Viola 4,458 ft., Simpson 4,544 ft., Arbuckle 4,655 ft.

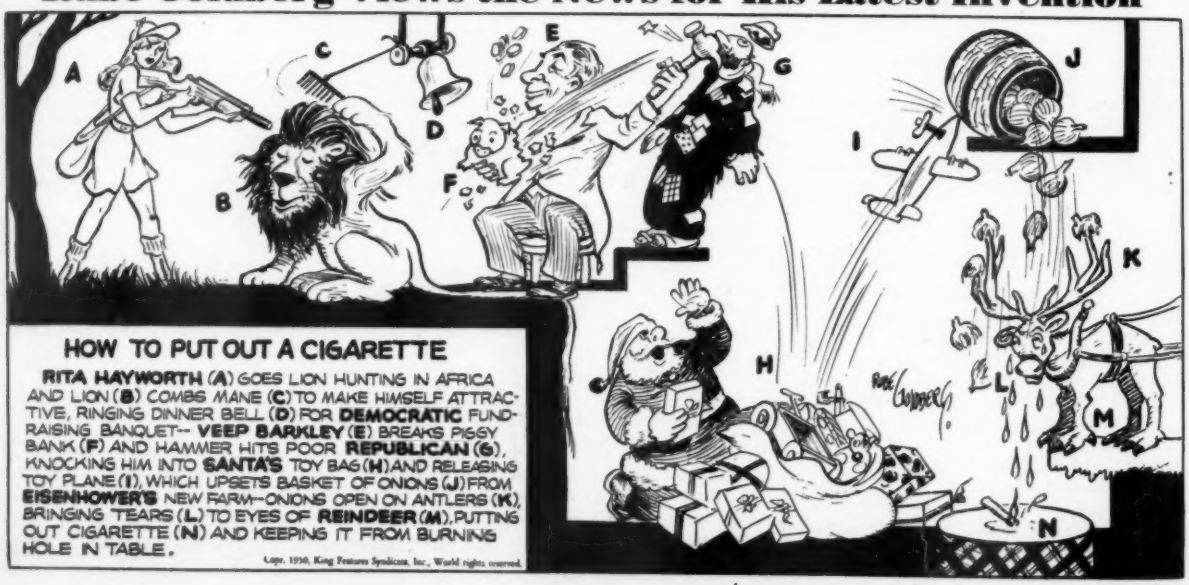
Rooks County: Madden-Mermis & Strain 1 Hunter, NW NW SW 8-9s-17w, elev. 1,985 ft., dry, TD 3,535 ft., anhydrite 1,325 ft., Howard 2,902 ft., Heebner 3,121 ft., Toronto 3,139 ft., Lansing-Kansas City 3,162 ft., Sooy 3,454 ft., Arbuckle 3,510 ft.

Jones-Shelburne & Farmer 1 Diehl, NE NE SW 34-8s-17w, elev. 2,014 ft., dry, TD 3,550 ft., Heebner 3,123 ft., Lansing-Kansas City 3,165 ft., Sooy 3,477 ft., Arbuckle 3,516 ft.

EASTERN NEBRASKA WILDCATS

Richardson County: Extension to Barada—Nunn-Pressman-Payne 1 Buckoltz, NE NE NE 3-2n-16e, elev. 1,115 ft., pumped 15 bbl. of oil per day from Hunton at 2,499-2,523 ft., TD; Mississippian 2,155 ft., Kinderhook 2,266 ft.

Rube Goldberg Views the News for His Latest Invention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HOW TO PUT OUT A CIGARETTE
RITA HAYWORTH (A) GOES LION HUNTING IN AFRICA AND LION (B) COMBS MANE (C) TO MAKE HIMSELF ATTRACTIVE, RINGING DINNER BELL (D) FOR DEMOCRATIC FUND-RAISING BANQUET-- VEEP BARKLEY (E) BREAKS PIGGY BANK (F) AND HAMMER HITS POOR REPUBLICAN (G), KNOCKING HIM INTO SANTA'S TOY BAG (H) AND RELEASING TOY PLANE (I), WHICH UPSETS BASKET OF ONIONS (J) FROM EISENHOWER'S NEW FARM--ONIONS OPEN ON ANTLERS (K), BRINGING TEARS (L) TO EYES OF REINDEER (M), PUTTING OUT CIGARETTE (N) AND KEEPING IT FROM BURNING HOLE IN TABLE.
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Oklahoma

Shallow Pool Indicated By Beckham County Test

A COMPARATIVELY shallow, granite-wash pool appears to have been uncovered by Carter Oil Co. and associates in their 1 State-Taylor, C SW SW 31-9n-21w, 3 miles east of the Carter townsite in southeastern Beckham County, western Oklahoma. Granite wash conglomerate carrying good staining and odor was cored from 2,995 ft. to the last reported total depth of 3,054 ft., where electric log has been run.

First drill-stem test, lasting 70 minutes, took in an interval at 2,951-3,005 ft., getting a flow of gas, estimated at 75,000 cu. ft. per day, within 3 minutes, and a recovery following the test of 2,170 ft. of 41.7° oil and 150 ft. of oil and gas-cut mud. Bottom-hole flowing pressure gaged 475 psi. With the well shut in, pressure built up to 1,050 psi. in 5 minutes.

A 3¼-hour test with hole cored to 3,028 ft. and taking in an interval below 3,000 ft. got only 90 ft. of oil and gas-cut mud with 1,050 ft. of salt water. An additional 60-minute test at 3,028-54 ft. also got only 60 ft. of oil and gas-cut mud with 30 ft. of drilling mud, but showed no water.

The indicated well was started as a 9,500-ft. test. It is on an unitized block of 5,736 acres, participated in by 13 companies and independents with Carter Oil Co. as the designated operator. The location is from 9 to 10 miles south of the Elk City field.

Deep Rock Oil Corp. 1 Ralstin, NE NE NE 20-17n-2e, promising northwestern Lincoln County wildcat, has encountered additional oil and gas showings in Red Fork sand. Sand was topped at 4,400 ft. A 60-minute drill-stem test at 4,402-15 ft. yielded 115 ft. of oil-cut mud. At latest report, operators were drilling ahead in Mississippian, logged at 4,533 ft. Previously, the well had found good showings in Skinner sand, logged at 4,266-74 ft. The location is approximately 3½ miles west and 2 miles south of Perkins, and about 1¼ miles south of the small Northeast Goodnight pool.

Production of the Northeast Longview pool in Noble County has been extended ¼ mile southwestward to provide another link in connecting this production with that of the South Ceres pool, the most northerly producer of which is only ¾ mile to the southwest. B. B. Blair 1 Wentz Estate, SE NW SE 31-24n-1e, the extension well, flowed 32 bbl. of oil in the first 3 hours following a Hydrafrac application in the pool's Bartlesville sand pay zone, open at 4,320-89 ft. Flow of 20 bbl. during the first 2 hours was through 20/64-in. choke. Flow the third hour was 12 bbl. through 10/64-in. choke.

OKLAHOMA SUCCESSFUL WILDCATS

Comanche County: Extension to Lawton—Pfau & Caldwell 5 Franklin, NW NW NE 22-2n-11w, pumped 2 bbl. of 33°-gravity oil per day from sand at 205-15 ft., TD; sand 98 ft. with show of oil.

Seminole County: New pay in Carr City—Ashland 2 M. T. Wise, NW NE SW 3-8n-5e, elev. 888 ft., pumped 68 bbl. oil per day from Marshall at 4,200-10 ft., TD 4,215 ft., base Wewoka 2,560 ft., upper Calvin 2,715 ft., Earlsboro 2,950 ft., lime 3,480 ft., Caney 3,605 ft., Mayes 3,645 ft., Woodford 3,780 ft., Misener 3,874 ft., Hunton 3,894 ft., Sulvan 3,923 ft., Viola 4,008 ft., dense 4,065 ft., dolomite 4,098 ft., first Wilcox 4,132 ft.

OKLAHOMA WILDCAT FAILURES

Creek County: Mercury Oil & Refining 1 Klintworth, SW SW SW 10-19n-8e, elev. 728 ft., dry, TD 2,627 ft., Big lime 2,044 ft., Oswego 2,075 ft., Skinner 2,324 ft., lower Skinner 2,248 ft., lime 2,390 ft., Red Fork 2,434 ft., Inola 2,514 ft., Barlesville 2,566 ft.

Garfield County: Zephyr Petroleum and Alpha Petroleum 1 Lovell, SE SE SW

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21-21n-4w, elev. 1,082 ft., dry, TD 4,682 ft., upper Layton 4,420 ft., Osage-Layton 4,420 ft., sand 4,517 ft., lower Layton 4,658 ft.

Harper County: Superior Oil Co. 1 Blasdel, C. NE NE 12-27n-22w, elev. 1,765 ft., dry, TD 7,495 ft., anhydrite 1,490 ft., Herrington 2,460 ft., Winfield 2,576 ft., Ft. Riley 2,640 ft., Topeka 3,437 ft., Douglas 3,845 ft., Lansing 4,723 ft., Kansas City 5,103 ft., Oswego 5,506 ft., basal Pennsylvanian-Chester 5,874 ft., St. Genevieve 6,145 ft., Osage 6,418 ft., Hunton 7,461 ft., Maquoketa 7,473 ft.

McIntosh County: Carter Oil Co. 1 Follansbee, SW NW SW 18-9n-15e, elev. 660 ft., dry, TD 5,461 ft., Booch 1,760 ft., Hart 2,092 ft., Atoka 2,228 ft., Wapanucka 3,797 ft., Union Valley 4,054 ft., Cromwell 4,099 ft., lower Cromwell 4,276 ft., Pennsylvanian Caney 4,307 ft., Mississippian Caney 4,352 ft., Mayes 4,675 ft., Woodford 4,792 ft., Hunton 4,808 ft., Sylvan 4,935 ft., Viola 4,998 ft., Arbuckle 5,390 (?) ft.

Murray County: Preston Carter 1 Brown, SW SW SW 26-1n-2e, dry, TD 2,000 ft., Simpson 1,900 ft.

Eastern Texas

Two New Operations In Falls County Play

DALLAS. — The new oil play centering around the town of Lott in Falls County gained two operations bordering on the townsite and one south of town. All of the tests are to be drilled by E. Fletcher, of Dallas, according to reports.

The proposed tests are to be the 1 A. B. Davis, on a 3-acre tract in the Hunnicutt Survey, and the 1 H. R. Gwyn, spotted on a 3-lot unit some 2,000 ft. from the first Gwyn test.

Third and deepest test of the trio is to be the 1 William Kyser, scheduled to 5,000 ft. as a Travis Peak exploration and located in the G. Webster Survey.

Fletcher 1 Conally Gwynn, on the south edge of town, reported good shows of oil in the Buda limestone. Casing was set on top of the lime at 1,330 ft. for production tests.

In western Cherokee County, National Associated Petroleum Co. 1 T. J. Roach reported a flow of salt water after two acid treatments through casing perforations at 8,610-16 and 8,620-26 ft. Total depth was 8,730 ft.

The same firm's 1 Mary Mullinax was drlling below 4,400 ft., on a 9,000-ft. contract.

In northern Cherokee County, Union Producing Co. was scheduled to begin operations at its 1 W. W. Dover, southeast outpost to a three-well area producing from the Woodbine.

F. R. Jackson and John C. Robbins were moving in material for immediate drilling of one of two new 6,500-ft. wildcats in the vicinity of Mineola in southwestern Wood County.

First test is to be the 1 R. E. Wisenbaker, ½ mile northeast of Mineola in the Andrew Hamilton Survey. Second test will be the 1 Benham & Co., in the E. A. Evans Survey, which lies within the Mineola townsite.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) SUCCESSFUL WILDCAT

Grayson County: Ada Oil Co. 1 S. T. Barnes, E. L. Stickney Sur., 1¼ mi. SE Sandusy, TD 7,806 ft., elev. 710 ft., Oil Creek sand 7,148 ft., perforated 7,160-76, 7,172-82 ft., IP flowed 193.2 bbl. 40°-grav. oil a day, 9/64-in. choke, GOR 956 cu. ft., TP 1,100 psi., CP 1,500 psi.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURES

Franklin County: W. M. Coats 1 M. L. Edwards, B. E. Gill Sur., 4 mi. NW Winnfield, dry, TD 5,385 ft.

Limestone County: Kelton & Lincoln 2

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Retta Murphy, P, Varella Sur., 1 mi. E Nigger Creek field, dry, TD 3,410 ft.

Smith County: Pure Oil Co. 1 A. S. Lolley, John W. Warren Sur., 12 mi. NE Tyler, dry, TD 4,325 ft.

Southwest Texas

Scattered Tests in Area Prove Disappointing

CORPUS CHRISTI.—Lone Star Gas Producing Co. has run a drill-stem test in the Upper Edwards lime on its 1 Sarah E. Ferry, wildcat test 10 miles east-southeast of Pleasanton in Atascosa County. Cores recently were taken from 8,085-8,135 ft. with recovery being 15 ft., 2 in. of dark brown hard crystalline lime with no porosity or staining. Core from 8,135-53 ft. recovered 10 ft., 4 in. of brown lime, spotted porosity, no fluorescence, and a strong hydrogen sulfide odor. The wildcat is located in the I&GN Survey, Section 1,699, Abstract 431. Drill-stem test from 8,082-8,153 ft. recovered 240 ft. of gas-cut mud. Bottom-hole flowing pressure was 1,825 psi. Operators are currently drilling ahead to contract depth of 8,400 ft.

In McMullen County, 1 mile northwest of the new Dilworth field, Ryan, Hays & Burke 1 Sealey Estate, Juan Ignacio Diaz Survey 41, Abstract 176, missed the pays found in the Dilworth wells and set 5½-in. casing at 3,320 ft. to test the shallow sands. Drill-stem test run at 3,263-71 ft., ¼-in. choke, recovered 70 ft. of oil and oily mud. Operators then ran drill-stem test at 3,282-88 ft. with recovery being 150 ft. of muddy salt water with slight oil show. Perforations have been squeezed.

At what appeared to be a prospective oil discovery, Humble Oil & Refining Co. is pulling tubing and preparing to abandon its 1 Oppenheimer & Land in Henry Castro Survey 55, Abstract 261, Frio County. Abandonment was ordered after drilling to 5,800 ft., setting 5½-in. string at 5,497 ft. and testing perforations at 5,424-37 ft. Recovery was salt water.

L. M. Lockhart has completed a fishing job in the 1 First National Bank of Chicago, wildcat test in Los Torritos-Maximo Domingue grant, Porcion 72, Hidalgo County. Operator has run a 4-in. liner to 8,975 ft. and is waiting on cement to set before testing first in a sand topped at 8,820 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Atascosa County: New pay at Charlotte—Humble Oil & Refining Co. 2 Emilia Lujan, John Noble Sur. 1,438, TD 7,014 ft., perf. 7,003-06 ft. (Austin chalk), IP 56 bbl. of oil per day, 37.9° gravity.

Brooks County: New pay at Palo Blanco—Howeth & Mason M-3 Kathleen Jones Alexander, Los Megueyes de Palo Blanco Grant, TD 4,746 ft., perf. 4,716-28 ft. (first Sejita), IP: 136 bbl. oil per day, ¼-in. choke, 42° gravity.

Duval County: New pay at North Charamousca—Dulaney Oil Co. 8 Duval County Ranch Co., CCSD&RGNG Sur. 155, A-783, TD 2,093 ft., top pay 1,986 ft., Upper Rosenberg, perf. 1,995-98 ft., IP: 45 bbl. oil per day, ½-in. choke, 31.7° gravity.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Bastrop County: Sparta Oil Co. 1 Etta Hess, R. Conley Sur., dry, TD 3,975 ft.

Cameron County: The Texas Co. 1 P. J. Davis, Espiritu Santo Grant, 3½ mi. NW of Brownsville, dry, TD 12,012 ft.

Duval County: Morris Cannan 2 The Dewell Co., S. B. Childres Sur. 176, A-1,707, 18 mi. NW of Freer, dry, TD 1,338 ft.

Jim Hogg County: Gorman & DeLange, et al, 1 Pilar G. de Garza, Share 2, Lasater Partition, Wm. Key Sur. 296, 24 mi. SW of Hebbronville, dry, TD 2,830 ft.

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al, Simon de Ynojosa Sur., A-356, 4 mi. E-NE of Hellen field, dry, TD 4,215 ft.

Jim Wells County: H. J. Mosser-F. William Carr, et al, 1 J. M. Canales, J. E. Stevens Sur. 358, A-442, dry, TD 6,501 ft.

Kendall County: C. G. Newton 1 Check Ranch, G. W. Lindsay Sur. 4, 3 mi. SW of Kendalia, dry, TD 2,338 ft.

Kleberg County: Southern Minerals Corp. 1 Sam Fimble, Jr., Lot 41, Block 25, Koch first Subdivision of Rivera lands, 1 mi. E of Canelo field, dry, TD 9,651 ft.

Nueces County: Glasscock Bros. et al, 1 Harriet Westover La Rochelle, Geo. H. Paul Subd. of Driscoll Ranch, dry, TD 10,120 ft.

San Patricio County: Lion Oil Co. 1 John Stinnet, Sec. Cubage & Miller Subd., 2 mi. NE of Edroy, dry, TD 6,803 ft.

Rand Morgan A-1 fee, Sec. 29, fourth Addn. of Taft Farm Landcs, 8 mi. NE of Taft, dry, TD 6,630 ft.

Travis County: Harris S. Stahl 1 Jewel Rosanky, James S. Montgomery Sur., 6½ mi. SW of Elroy, dry, TD 2,030 ft.

John Bollinger Sur. 315, 4½ mi. NE Zephyr, dry, TD 600 ft.

Clay County: Carl F. Anderson & Co. 1 L. T. Burns, Sec. 62, Blk. 22, Hopkins CSL, 3 mi. S Bluegrove, dry, TD 4,709 ft.

Jack Grace Production Co. 1 Hapgood, Calhoun CSL, 5½ mi. E Blue Grove, dry, TD 6,421 ft.

Frank Wood & Bros., Inc. 1 D. W. Harding, MEP&P Sur., 1½ mi. SW Petrolia, dry, TD 1,825 ft.

Coleman County: Glass-Hagan 1 T. M. Hayes Estate, M. Gross Sur. 44, 2 mi. N Santa Anna, dry, TD 1,937 ft.

Hickok & Reynolds 1 T. L. Miller, Sec. 759, IRR Sur., 3½ mi. NW Echo, dry, TD 3,597 ft., elev. 1,650 ft., Caddo 2,650 ft., Marble Falls 3,134 ft., Ellenburger 3,432 ft.

Cooke County: R. P. Elkins 1 R. W. Trew, H. Whitesides Sur., 5 mi. NW Muenster, dry, TD 2,352 ft.

C. J. Van Horn 2 Charles Cler, Henry Dixon Sur., A-335, 3½ mi. NW Muenster, dry, TD 2,244 ft.

Eastland County: Bankline Oil Co. 1 F. J. Kimmell, 71-4-H&TC, 8 mi. N Cisco, dry, TD 4,118 ft., elev. 1,427 ft., Palo Pinto 1,140 ft., Capps 1,466 ft., Marble Falls 3,537 ft., Ellenburger 4,017 ft.

Fisher County: Ryan & Abott 1 R. R. Allen, 2-318-Gillespie, CSL, 5 mi. S Roby, dry, TD 4,270 ft., elev. 2,019 ft.

Jones County: J. F. Baker 5 S. A. Kelley, Sec. 8, Holt & Swenson Subd., 1½ mi. N Hawley, dry, TD 2,104 ft.

Farris Oil Co. 1 L. H. Thomas, Sec. 22, R. A. Spencer Sur., 5 mi. W Lueders, dry, TD 2,776 ft., elev. 1,597 ft., reef lime 2,766 ft.

Primo Oil Co. 2 A. H. Lungren, Sec. 174, BBB&C Sur., 4½ mi. E Avoca, dry, TD 3,777 ft., elev. 1,568 ft., lime 3,642 ft.

Montague County: Jones, McFarland & O'Connell 1 R. P. Elkins, A. Buffington Sur., 1 mi. S Nocona, dry, TD 6,444 ft., Bend conglomerate 6,040-65 ft., Viola 6,440 ft.

North Central Texas

Wise County Test Gets Show in Strawn Sand

WICHITA FALLS.—T. G. Shaw 1 Frank Menn, projected Caddo wildcat southwest of Cottondale in Wise County, and northwest of the Daly Caddo area, bailed about 1 bbl. of high-gravity, light green oil an hour from Strawn sand at 3,155-72 ft. Operators said the oil bordered on distillate. Top of the Strawn limestone was 3,300 ft.

Continental Oil Co. 1 Bertha Flowers, also in southwest Wise County, was testing through perforations in the conglomerate from 5,638-56 ft. After washing with 500 gal. of mud acid and treating with 500 gal. of regular acid, the well flowed an unreported amount of load oil, with gas estimated at 86,000 cu. ft. daily.

A good confirmation well was brought in for the new Strawn sand area of southeast Archer County. Greenbrier Oil Co. recently opened the area, then drilled its 1-D Prideaux as a southwest offset to the discovery. On completion test the well flowed 108½ bbl. of 42°-gravity oil in 18 hours through ¼-in. tubing choke, for a daily potential of 151 bbl. Pay was from 3,686-92 ft.

In northeastern Fisher County, Texas Pacific Coal & Oil Co. 1 Toler, Ellenburger exploration, gave up on the deeper formation and plugged back for completion as a Swastika-sand discovery.

Total depth, with cable tools, was 6,053 ft. Operators plugged back to 3,820 ft. and made final perforations in sand from 3,773-84 ft. On preliminary test the well flowed 91 bbl. of 40°-gravity oil a day through ½-in. choke. Flowing pressures were 115 psi. on tubing and 250 psi. on casing.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Clay County: A. R. Dillard 1 Frank Bunting, Sec. 2,613, TE&L Sur., 5 mi. NW Antelope, TD 4,410 ft., Strawn sand pay 4,358 ft., shot 4,348-70 ft., LP pumped 114 bbl. oil a day.

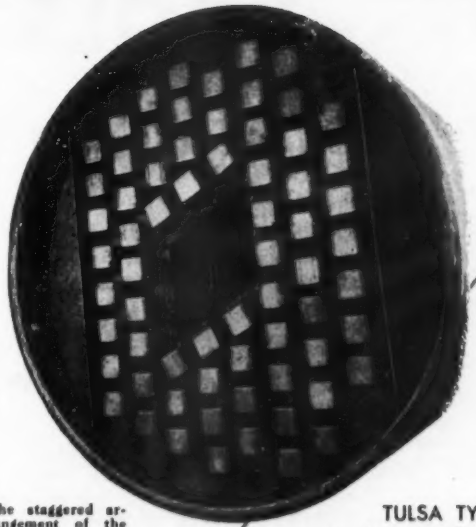
Jack County: Mid-Continent Petroleum Corp. 2 J. W. Campbell "A," SFIW ft., elev. 992 ft., Ellenburger 5,992 ft., Sur., A-555, 7 mi. S Post Oak, TD 6,165 IP flowed 4,400,000 cu. ft. gas a day, perforations 5,292-5,302 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: Henry Grace Production Co. 1 G. R. Garvey, S. H. Smith Sur., A-370, 11 mi. SE Archer City, dry, TD 4,698 ft., Caddo 4,574 ft.

H. F. Snebold 1 L. E. McConnell, Blk. 62, Brazos CSL, 5 mi. NW Scotland, dry, TD 4,811 ft.

Brown County: Clarence F. Chang & Associates 1 Lucy Belle Damron, Blk. 7,



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Product No. 415-D

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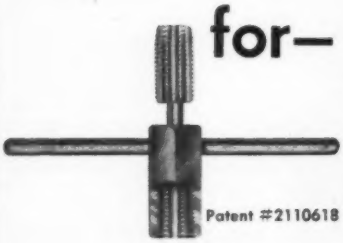

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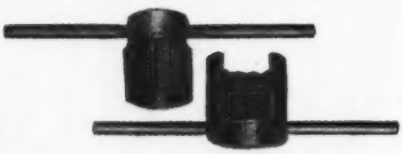

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Palo Pinto County: W. M. Massie and J. B. Clardy 3 W. C. Bridges, Wm. Metcalf Sur., 7 mi. W Graford, dry, TD 1,816 ft. Shackelford County: Milton Lewallen 1 Tom

(Continued on page 167)

Canadian Fields

Red Deer Lake Wildcat To Test D2 Devonian

CALGARY.—McCarty & Coleman Group's key wildcat venture in the Red Deer Lake area of central Alberta was scheduled to run the determining D2 Devonian zone drill-stem test today. The interval, 5,095-5,106 ft., will be tested: then regardless of outcome of the hole will go down in search of D3 reef. The well, McCarty & Coleman-Walter Glen 1, in LSD 1, 28-43-22w4, found about 6 ft. of porous D2 dolomite from 5,100 ft. to bottom, 5,106 ft., with slight oil staining appearing in that section. A test from 5,058-68 ft. gave up 150 ft. of gas and oil-cut mud. Cores from 5,068-5,106 ft. were tight, but gave dense dolomite with shows of oil and gas in fractures. The well is logging sufficiently higher than previous ventures in the general area (which found evidence of D3 reef) to offer a good chance of reef at level which might yield production.

Production string of casing has been set at the Basal Cretaceous oil discovery near Drumheller, and it is expected that swabbing operations will commence within a few days. The oil discovery, Naco Drumheller 2, in LSD 14, 36-29-20w4, is located about 65 miles northeast of Calgary and 4 miles west of Naco 1 gas well. The well rated around 39 ft. of Cretaceous oil pay in the interval, 4,428-67 ft. Gravity of the oil is about 34° A.P.I.

Great Plains Development Co. of Canada, Ltd., has made a natural gas strike and obtained a showing of oil in top of the Madison limestone at its well in the Barrhead area of central Alberta. The well, Great Plains-Omeara-Barrhead 4-14, in LSD 4, 14-58-5w5, is located about 17 miles southwest of Barrhead town and 55 miles northwest of Edmonton. It is situated on farmout lands from O'Mear Canadian Drilling Co. Two drill-stem tests at Great Plains 4-14 gave the following results: on a 2-hour test of interval 3,953-71 ft., through ¼-in. choke, gas flow settled down over 1 hour open flow to 2,420,000 cu. ft. daily in the last 30 minutes. Pipe recovery was 30 ft. of oil and gas-cut mud, after tester was closed in for 1 hour. On a 3-hour test from 3,966-76 ft., through ¼-in. choke, gas flow on several measurements varied from 30,000 to 302,000 cu. ft. daily. Pipe recovery was 75 ft. of heavily oil-cut, gassy mud. There was no water evident on either tests. Well 4-14 is currently standing cemented with 7-in. string of casing set at 3,970 ft. It is planned to jet perforate the open-hole section and acidize on the basis of diamond core analysis. Further testing of the well's potentialities will then follow.

Socony-Duhamel 29-14 well has fully penetrated the D2 zone of Devonian, after finding 121 ft. of D2-Devonian pay zone. The well, owned by Socony-Vacuum Exploration Co., is located in LSD 14, 29-45-21w4, about 2 miles north of the company's Flint 1 dual-zone Devonian oil discovery and about 13 miles southwest of Camrose. D2 zone was topped at 4,417 ft. The top 66 ft. of zone was highly productive of natural gas, with daily-rate tests ranging from 2 to 8 million cu. ft. The final 55 ft. gave small gas flows, plus an indicated large potential of light crude oil with 34° A.P.I. gravity, estimated at around 2,000 bbl. daily rate. No water showed in the D2 zone. The well is now at 4,616 ft. in green shale. Crew is currently making repairs to rig prior to running string of protective casing and proceeding down in search of D3 reef.

Oregon Petroleums, Ltd., American inde-

pendent, reported that oil saturation has been found in about 15 ft. of porous Devonian limestone at its Oregon 2 wildcat in west central Saskatchewan. A drill-stem test is slated to be made. The well is in LSD 16, 25-42-25w3, in the Winter area north of the Unity gas field.

CANADIAN SUCCESSFUL WILDCAT

Barons 1, in LSD 10, 15-12-23w4, TD 4,114 ft., Viking sand oil discovery, IP 196½ bbl. per day on restricted flow. Gravity 32½ A.P.I.

CANADIAN WILDCAT FAILURES

Imperial-Barre 1, in LSD 9, 6-56-25w4, TD 4,700 ft.

Canadian Superior-Youngstown 5-9, in LSD 5, 19-28-9w4, TD 4,066 ft.

Michigan

Two Wells Brighten Outlook For Clear Lake Traverse Pool

MOUNT PLEASANT. — The Clear Lake Traverse oil pool, Pine Grove Township, Van Buren County, was given a boost in possible importance this week. One well on the northwest side of the developed field area was completed with a production rating of approximately 120 bbl. of oil per day after acid treatment, and another west side well showed 400 ft. of free oil with some water, from the Traverse 30 minutes after pay was tapped. Both wells appeared to be better than the average completed producer for the field and may stimulate an accelerated drilling program on the west side.

The new 120-bbl. producer was at Lowell Bernhardt 2 Gilbert, NW SW SE 4-1s-13w, where Traverse lime was logged at 1,394 ft. and drilling tools were racked at 1,397 ft., total depth. Hole carried five bailers of free oil natural in an hour from pay at 1,396-96½ ft. before treatment with 500 gal. of acid. The 2 Gilbert is the north offset to a producing well. It will probably draw offset drilling to the north, east and west.

At Christian Oil Co. 1 Corrandina, SE SW SE 4-1s-13w, the other Clear Lake well being completed this week, Traverse lime was found at 1,365 ft. and hole drilled to 1,366 ½ ft. total depth. Oil pay showed from 1,366 ft. to bottom. Well showed 400 ft. of free oil and a show of water natural. Tubing was being run for acid treatment. The 1 Corrandina offsets a producer to the east and is two locations west of the other nearest producing well in the field. Further drilling around this well is expected.

Smith Petroleum Co. announced a new start in the Clear Lake field this week, at the 1 Wesler, SE NW NE 9-1s-13w, only other active operation in the field.

Since the new Van Buren County Traverse field was opened; six oil producers and one dry one have been drilled in the immediate discovery area.

MICHIGAN WILDCAT FAILURES

Allegan County, Ganges Township: Ford Oil Co. 1 Williamson, SW SW SW 28-2n-16w, Traverse 1,283 ft., dry, TD 1,288 ft.

Heath Township: F. W. Kehlet and Wm. B. Drake 1 Lemoin Estate, SE NW NE 35-3n-14w, Traverse 1,462 ft., dry, TD 1,491 ft.

Otsego Township: Harry Stroud 1 Smith, SE SW SE 12-1n-12w, Traverse 1,583 ft., dry, TD 1,621 ft.

Kent County, Gaines Township: Universal Drilling Co. 1 Huizenga, SW NW NE 9-5n-11w, Traverse 1,928 ft., dry, TD 1,935 ft.

Osceola County, Hartwick Township: Edwin C. Meredith 1 Cruikshank, SE SE SE 15-19n-8w, Dundee 4,168 ft., dry, TD 4,326 ft.

Hersey Township: E. Edwin Brehm 1 Grein, NW NE NE 8-17n-9w, Dundee 3,746 ft., Reed City zone 3,815 ft., dry, TD 3,880 ft.

Mississippi

Abandoned Cary Field Gets New Producer

JACKSON. — In the old abandoned Cary field, Sharkey County, Memphis Petroleum Corp. has completed 1 Houston, NW NW NW 23-11n-7w, as an oiler. The well pumped at the rate of 70 bbl. of 25°-gravity oil and 2,175 bbl. of salt water per day. Hole was drilled to 3,254 ft. and 7-9-in. production casing run to total depth. Well was then drilled in with cable tools to total depth of 3,260 ft. after passing through an estimated 1 ft. of pay section.

Humble Oil & Refining Co. has abandoned 1 W. A. Stockard, et al, 33-1n-6e, Amite County, Mississippi, at total depth of 12,500 ft. Before abandonment, Humble plugged back to 12,052 ft. and perforated 11,660-70 ft. (Lower Tuscaloosa) for testing. Tool was open 14 hours and recovery was water cushion, 13 stands of mud and oil and 2 stands of clean 37.5°-gravity oil.

Lion Oil Co. has cored slight shows of oil at its deep Franklin County wildcat, 1 Louis McGehee, 22-5n-5e. The company hit a drilling break at 10,928 ft. and has cored continuously to 11,008-18 ft. In the core at 10,976-96 ft., recovery included 8 in. of siltstone with stain and odor but with no permeability.

In Adams County, Hunter Jones 1 Joseph W. Parker, et al, 3-3n-5w, is drilling below 7,285 ft. with no shows indicated to date. Wilcox was topped at 5,206 ft., "4,600-ft. sand" at 5,515 ft. and base Big shale at 6,560 ft. By comparison, the Hunter Jones well is 352 ft. lower on top of Wilcox than Sinclair 1 Sharp, Accretion 10-4n-9e, Concordia Parish, Louisiana, recent discovery located across the Mississippi River.

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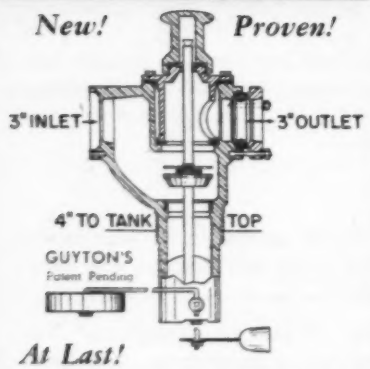

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MISSISSIPPI SUCCESSFUL WILDCAT

Jones County: Oil discovery—Ginther-Warren-Ginther 1 L. L. Major, 20-6n-11w, TD 9,932 ft., top sand 7,350 ft., (Christmas-Eutaw), perf. 7,348-80 ft., IP: 80 bbl. oil per day on pump.

MISSISSIPPI WILDCAT FAILURES

Amite County: Humble Oil & Refining Co. 1 W. A. Stockard, et al, 33-1n-6e, dry, TD 12,500 ft.

Jefferson County: Robert Oil Co.-Lyle Cashion Co. 1 Gordon & Stowers, 8-9n-2w, dry, TD 6,515 ft.

Appalachian Field

Operators Move in for New Maryland Test

PITTSBURGH. — In the Mountain Lake Park section, Garrett County, Maryland, Eberly & Snee are moving in at a new location, 1 R. L. Gilbert. It is on the Oakland quadrangle and approximately 0.9 mile southwest of the recent Welch discovery well.

In Leidy Township, Clinton County, North Central Pennsylvania, Godfrey L. Cabot, Inc., completed 2 Jessie D. Calhoun, elevation 859 ft., resulting in 480,000 cu. ft. of gas, after shot. Forty-eight-hour rock pressure was 4,075 psi. Onondaga lime was reached at 5,636 ft., Oriskany sand 5,658-78 ft., gas 5,659 ft., total depth 5,689 ft.

In Steele district, Wood County, West Virginia, Limestone Hill section, three gas wells were completed in the Oriskany sand: United Carbon Co. 1-1740 Wattie R. Ayers, elevation 846 ft., resulted in 4,142,000 cu. ft. of gas, natural, 2-hour rock pressure 445 psi., Corniferous lime 4,913 ft., Oriskany sand 5,041 ft., total depth 5,052 ft.; Glen W. Roberts 1 Robert W. Ayers, elevation 985 ft., gaged 3,953,000 cu. ft. of gas, natural, 16½-hour rock pressure 520 psi., Corniferous lime 5,120 ft., Oriskany sand 5,240 ft., gas 5,248-58 ft., total depth 5,266 ft.; Columbian Carbon Co. 1-GW-1157 Earl Ryan et al, elevation 834 ft., tested 198,000 cu. ft. of gas, after shot, Corniferous lime 4,880 ft., Oriskany sand 5,015 ft., gas 5,015-50 ft., total depth 5,067 ft.

In Clay district, H. L. Starr completed a wildcat, 1 Dr. Ira Connolly, elevation 695 ft., resulting in a dry hole, Corniferous lime 5,058 ft., Oriskany sand 5,206 ft., salt water 5,216 ft., total depth 5,216 ft. Three good shallow-sand gas wells were noted: Grant district, Wayne County, Beechy Branch Gas Co. 1-A Huntington Development & Gas Co. resulted in 1,476,000 cu. ft. of gas, Salt sand, total depth 709 ft.; Lincoln district, United Fuel Gas Co. 48-6626 F. D. Caldwell gaged 1,391,000 cu. ft. of gas in the Maxton sand, total depth 1,156 ft.; Union district, Putnam County, West Virginia Gas Corp. 1-556 O. O. Jividen tested 1,050,000 cu. ft. of gas in the Brown shale, total depth 4,684 ft.

WEST VIRGINIA SUCCESSFUL WILDCATS

Wood County, Steele district: United Carbon Co. 1-1740 Wattie R. Ayers, elev. 846 ft., 4,142,000 cu. ft. of gas, natural, Corniferous lime 4,913 ft., Oriskany sand 5,041 ft., gas in sand, TD 5,052 ft., 2-hour rock pressure 445 psi.

Glen W. Roberts 1 Robert W. Ayers, elev. 985 ft., 3,953,000 cu. ft. of gas, natural, Corniferous lime 5,120 ft., Oriskany sand 5,240 ft., gas 5,248-58 ft., TD 5,266 ft., 16½-hour rock pressure 520 psi.

Columbian Carbon 1-GW-1157 Earl Ryan et al, elev. 834 ft., 198,000 cu. ft. of gas, after shot, Corniferous lime 4,880 ft., Oriskany sand 5,015 ft., gas 5,015-5,050 ft., TD 5,067 ft.

WEST VIRGINIA WILDCAT FAILURE

Wood County, Clay district: H. L. Starr 1 Dr. Ira Connolly, elev. 695 ft., dry, Corniferous lime 5,058 ft., Oriskany sand 5,206 ft., salt water 5,216 ft., TD 5,216 ft.

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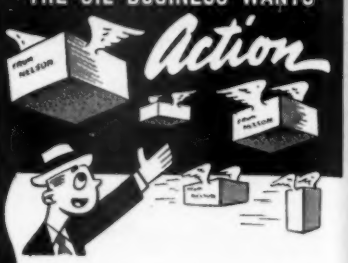

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Texas Gulf Coast

Spindletop North Flank Gets New Pay Strike

HOUSTON.—New pay has been opened on the north flank of Spindletop Dome, Jefferson County, at Stanolind Oil & Gas Co. B-107 Bladys City Oil & Manufacturing Co., John Veatch Survey. In 23 hours, the well flowed 170 bbl. of oil through ¼-in. choke with 120-psi. tubing pressure. Production is through perforations at 4,766-800 ft. The well also tested oil on drill-stem tests made at 4,768-80 ft. and 4,780-90 ft.

Paul J. Fly and associates are preparing to run state potential test at their Frio sand discovery well in Goliad County. The discovery, 1 Lula Swickheimer, W. P. Patterson Survey, Abstract 325, is bottomed at 4,863 ft. and 5½-in. production string is cemented at 4,722 ft. Before setting casing, sidewall cores taken at 4,654-64 ft. indicated 10 ft. of oil saturated sand in the basal Frio. Casing was jet-perforated at this interval, and on initial test, the well flowed 75 bbl. of 26.4°-gravity oil per day through ¼-in. choke. Tubing pressure was 580 psi.

McCarthy Oil & Gas Corp. B-1 W. S. Davidson estate, new pay for North Big Hill field, Jefferson County, flowed 214 bbl. of 40°-gravity oil per day on potential test. Hole was drilled to 11,417 ft. and completion was made through perforations at 8,424-32 ft. Tubing pressure on the test was 2,080 psi. The new sand discovery is located in the J. E. Broussard Survey, Abstract 483.

East of Fred field, Tyler County, Stanolind has potentialed 5 James F. Parker et al., new oil discovery, for 80 bbl. of 46°-gravity oil per day through perforations at 8,532-43 ft. Location is in George T. W. Collins League.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCAT

Wharton County: Gas condensate discovery "W. Bernard"—Tide Water Associated Oil Co. 1 B. G. Womack, John F. Stevenson Survey, A-415, TD 7,825 ft., perf. 7,086-89 ft., IP: 14,000,000 cu. ft. of gas plus some 53.3°-gravity condensate.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Bee County: H. R. Smith-Morris Mizel-William H. Winn 1 Texas A. & M. College, Teodoro Molina Sur., A-42, 5 mi. NE of Beeville, dry, TD 3,315 ft.

Colorado County: C. N. Housh-American Republics Corp. 1 W. R. Sronce, E. Tumlinson Sur., A-44, ¾ mi. S of Columbus, dry, TD 9,701 ft.

Galveston County: John W. Mecom 1 Lucy F. Thompson-University of Texas, Samuel Bundick Sur., A-7, 4 mi. SW of Texas City, dry, TD 7,603 ft.

Goliad County: F. A. Gillespie & Sons Co. 1 A. O. Kenne, Joseph T. Kilgore Sur., A-172, 9 mi. NE of Goliad, dry, TD 4,250 ft.

Pryor Dillard 1 Ernest Hohenberg, John Jones League, 12 mi. NE of Seguin, dry, TD 1,505 ft.

Harris County: W. H. Bryant, et al, A-1 J. F. Oates, Edwin Stimpson Sur., A-702, 3 mi. S of Humble, dry, TD 6,514 ft.

Providence Oil Co. 1 Martha O'Connor, John Dunman Sur., dry, TD 6,511 ft.

Jefferson County: The Texas Co. 1 W. C. Baird Estate, B. F. Howard Sur., A-411, 8 mi. SW of Sabine, dry, TD 8,500 ft.

Lavaca County: Skelly Oil Co. 1 R. C. Boettcher, Sarah Wilmans Sur., A-493, 4 mi. NE of Smothers field, dry, TD 9,590 ft.

Montgomery County: Ryan & Abbott 1 William M. Rice Institute, J. E. Lewis Sur., A-665, dry, TD 9,701 ft.

Refugio County: Kirkwood & Morgan, Inc., and O. L. Holcomb, et al, 1 Lizzie Wotpika, T. D. Wood Bonnie View Ranch, Esteban Lopez Sur., dry, TD 6,761 ft.

Victoria County: Quintana Petroleum Corp. 1-B Henderson & Pickering, A. B. Williams Sur., A-353, dry, TD 7,020 ft.

Rock Hill Oil Co., et al, 1 E. A. Jacob, Elija Stapp Sur., A-111, dry, TD 4,023 ft.

Wharton County: Brazos Oil & Gas Co. 1 William K. Connor, Geo. W. Reynolds Sur. 50, A-483, dry, TD 5,400 ft.

South Louisiana

Glenmora Field Gets Deepest Producer

NEW ORLEANS.—The deepest producer in Glenmora field, Rapides Parish, has been completed at Texas Pacific Coal & Oil Co. 2 J. A. Bentley. The well is bottomed at 11,709 ft. in Midway shale, and casing was perforated at 11,169-73 ft. in a basal Wilcox sand. Initial flow was 107 bbl. of oil in 14 hours through 10/64-in. choke. Tubing pressure was 1,900 psi. and shut-in pressure 2,200 psi. The well lies in C SW NE 36-1s-2w. Meanwhile, Texas Pacific is drilling below 10,166 ft. in lime and shale at 3 J. A. Bentley, NE SE 34-1s-2w. Eleven miles northeast of Marksville in Avoyelles Parish, Hunt Oil Co. is rigging up to drill a wildcat test scheduled to go through the Wilcox zone. Drillsite for the new exploration lies in C NE NW 34-3n-5e.

Jake L. Hamon and Edwin B. Cox have failed to drill below 10,785 ft. due to lost circulation at 1 Daigle, 83-8s-2e, Acadia Parish wildcat. Operators were forced to run cement job on open hole in order that circulation might be maintained. Ultimate goal for the wildcat is 11,600 ft.

At a new prospective field opener in Acadia Parish, 2½ miles west of the South Bayou Mallet field, Bates & Cornell have patched a leak in the casing of 1 August Leonards, 29-7s-1e. Operators are preparing to perforate and squeeze above the producing zone. The wildcat is at total

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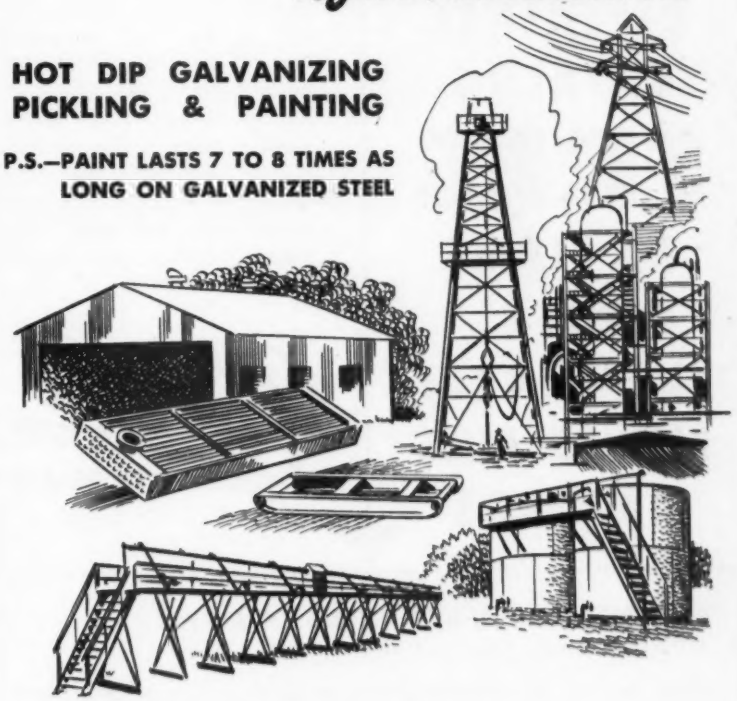

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depth of 9,976 ft. with casing set to 9,81[illegible] ft. Oil and gas shows which may be pro[illegible]ductive are at 9,945-76 ft.

SOUTH LOUISIANA WILDCAT FAILURES

Avoyelles Parish: Hunt Oil Co., et al, 1 Charles B. Petersen, et al, 31-4n-6e, 1 mi. SE of So. Larto Lake field, dry, TD 7,006 ft.

Beauregard Parish: Atlantic Refining Co. 2 Rice Land & Lumber Co. "A," 23-3s-11w, dry, TD 7,003 ft.

St. John the Baptist Parish: The Texas Co. 1 Joseph Rathborne Land & Lumber Co., Inc., 84-12s-18e, dry, TD 12,071 ft.

St. Mary Parish: Atlantic Refining Co. 1 Adeline Sugar Factory "C," 33-13s-9e, dry, TD 11,500 ft.

California

New Heavy-Oil Field For Kern County

LOS ANGELES.—Kern County, in the San Joaquin Valley district of California, has been given a new heavy-oil field. The discovery was at Edison Groves, between the Race Track Hill and Ant Hill fields.

The wildcat was Richfield Oil Corp. 1 Shields-Arms, in Section 32-29s-29e, or about 1½ miles northwest of production in Race Track Hill. It was completed flowing at the rate of 354 bbl. daily through a 22/64-in. bean. Crude was 12.5° gravity. Bottomed at 3,672 ft. and plugged back to 3,580 ft., the flow was made through 80 ft. of perforations above the plugged-back depth. The new oil sand, topped at about 3,490 ft., is shallower than the Pyramid Hills and Vedder pays which are productive at Race Track Hills.

At Wasco, also in Kern County, a new world's producing depth record appears to be in the making. Well threatening the existing 15,530-ft. record is Standard Oil Co. of California 2 Mushrush, located ½ mile southeast of the current record holder, Standard 5 Mushrush. At last reports it was bottomed at 15,530 ft. in an Eocene sand topped at about 15,350 ft. At that depth the operator was running liner preparatory to completion.

In the Los Angeles region field developments included a new pool discovery in the Alamitos Heights portion of the Seal Beach field, southern Long Beach. Pool opener was J. I. M. Petroleum Co. 1 Freeman, near Flint and Colorado streets in 3-5s-12w. At a depth of about 6,100 ft. the well flowed some 250 bbl. daily of 24°-gravity crude through a ¾-in. bean, with a gas output of 1,188 M.c.f.

At Castaic Creek in northern Los Angeles County, The Texas Co. was running liner preparatory to completing its 2 Honor Rancho in a new oil zone. On a flow test at 6,365 ft. with hole plugged back to 6,530 ft., the well flowed 158 bbl. into tanks in 15-hour, 20 per cent cut.

Located in 1-4n-17w, 2 Rancho is a 990-ft. west stepout from No. 1 well, which in August was completed in a 5,269-5,418 ft. upper Miocene sand for 1,400 bbl. daily.

At nearby Castaic Junction, Humble Oil & Refining Co. was preparing to complete a shallower sand pool opener. Located in 24-4n-17w, Humble 3 Newhall Land & Farming showed for a 20°-gravity oil producer in an upper Mohnian sand. The interval from 9,815-9,865 ft. was gun perforated in preparation to completion. The other two Humble wells at Castaic Junction produce from a 11,800-ft. Mohnian sand.

CALIFORNIA WILDCAT FAILURES

Kern County, Bitterwater area: Tide Water Assoc. 35-14 "Well," 14-27s-19e, dry, brown shale 650 ft., Packwood sand 2,122 ft., upper Agua 2,623 ft., TD 2,692 ft., elev. 804 ft.

Carrizo Plains area: Wm. R. Whittaker Co., Ltd. 1 Marita, 31-28s-19e, dry, TD 2,053 ft., elev. 2,906 ft.

Mount Poso area: Walter De Courcy 1

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Bellport, 8-27s-28e, dry, Vee-ler 2,072 ft., TD 2,080 ft., elev. 1,165 ft.

Tejon Hills area: Kova Petroleum Assoc. 1-G Kova-Petroleum Anniversary, 9-11n-18w, dry, TD 805 ft., elev. 1,107 ft.

East Tejon Hills area: Bear Mountain Oil Co. 2 Bear Mountain, 12-11n-18w, dry, TD 1,293 ft., elev. 1,297 ft.

Los Angeles County, West Antelope Valley area: H & K Exploration Co. 87-21 Ben Hur, 21-8n-15w, dry, bottomed in boulders, TD 3,430 ft., elev. 2,835 ft.

Sand Canyon area: Sandee Oil Co. 1 Brooks, 2-3n-15w, dry, TD 2,672 ft., elev. 964 ft.

Newhall - Placerita area: F. E. Ellis 1 Lowe, 36-4n-16w, dry, deepened from 2,587 ft., TD 3,445 ft., elev. 1,205 ft.

South Oak Canyon area: Western Gulf Oil Co. 1 Foley, 5-4n-17w, dry, TD 8,458 ft., elev. 1,575 ft.

Merced County, Denair area: Ohio Oil Co. 1 Evans & Cook, 23-5s-11e, dry, TD 6,552 ft., elev. 140 ft.

San Benito County, Sargent area: Jack Herley, Opr. 2 O'Connell, 9-12s-4e, dry, TD 3,594 ft., elev. 500 ft.

Santa Barbara County, Cuyama Valley area: Richfield Oil Corp. 1 Cuyama Oil Co., 32-11n-28w, dry, TD 1,612 ft., elev. 1,944 ft.

South Cuyama area: Universal Consolidated Oil Co. 21-16 Pickrell, 16-9n-26w, dry, TD 9,315 ft., elev. 3,062 ft.

Ventura County, Gorman area: Barney-Cornett & Assoc. 1 Little, 22-8n-19w, dry, TD 943 ft., elev. 3,985 ft.

Rocky Mountain

Two Utah Wildcats Get Gas Shows in Uinta Basin

DENVER.—Two important wildcats in Utah have reported shows of gas this week. California Co.'s 1 Unit, NE NE NE 26-7s-23e, in the Red Wash area, Uintah County, reportedly found shows in a zone between 4,166-4,254 ft., and on test had a strong, ungaged gas blow. This well is reported to have topped Green River zone at around 2,900 ft. and is planned as a basal Green River zone test to around 6,000 ft. The well is a tight hole, with no official release of information other than depth. It is located southeast of Carter Oil Co.-Stanolind Oil & Gas Co. Roosevelt pool, where basal Green River oil production is around 9,000 ft.

Gas with sulfur water is also reported at General Petroleum Corp. wildcat, 45-5-G, NE NE SW 5-24s-15e, in the San Rafael River area, Emery County. On drill-stem test at 3,618-3,712 ft. with tool open 1 hour, there was a strong gas blow immediately with the recovery of 1,800 ft. of salty sulfur water cut with sour gas.

After completing a wildcat failure in the Basin and Range Province at 1 Unit, SW NE SE 31-16n-56e, in the Meridian area, Nevada, Continental Oil Co. and Standard Oil Co. of California are now spudding on a new deep test in White Pine County. The well is 1 Unit, C NE NE 17-15n-59e, 12 miles east of the recent failure, and Standard is operator of the new well. Standard joined in Continental's big acreage spread throughout the Nevada portion of this province a year ago and also has sizable holdings on its own through the Utah part of the province. In Millard County, Von Glahn Oil Co. is moving in a rotary for a wildcat at 1 Government, C NW NE 29-24s-18w, Millard County. This well will also be of importance for future operations in the area, and additional tests are reportedly planned for this portion of the province.

Importance of Hydrafrac treatment on sands in the Denver-Julesburg basin was proven this week by British-American Oil Producing Co. at 1 Ramey, NW SE NW 21-9n-53w, in the Mount Hope area, Logan County. This well was drilled to 5,226 ft., total depth, with the "J" sand topped at 4,935 ft., where 510 ft. of free clean oil was

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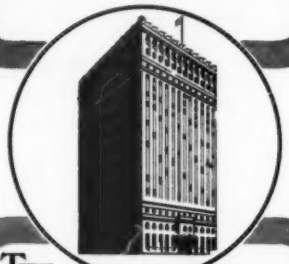

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recovered on 1 hour 45-minute test in that sand. Casing was cemented at 5,226 ft., and the well has been shut down for several weeks. British-American treated the well with Hydrafrac, and after running swab the well started flowing and made 226 bbl. of oil and 12 bbl. of water in 24 hours.

COLORADO WILDCAT SUCCESS

Ignacio, La Plata County: Stanolind Oil & Gas 1 Ute Indian, C SE NE 18-33n-7w, TD 7,919 ft., PB 7,750 ft., flow est. 15,000 M.c.f. gas daily, gage through choke 4,800 M.c.f., Wasatch 1,098 ft., Animas 2,108 ft., Pictured Cliffs 2,510 ft., Dakota 7,360 ft., Morrison 7,590 ft.

WYOMING WILDCAT FAILURE

Hat Six area, Natrona County: Seaboard and Tide Water 54-33 Lathrop, SW SW NE 33-33n-77w, TD 4,774 ft., dry, Shannon 595 ft., first Wall Creek 2,806-74 ft., second Wall Creek 2,888-3,008 ft., third Wall Creek 3,207-28 ft., Muddy 3,917 ft., Dakota 4,034 ft., Lakota 4,104 ft., Morrison 4,283 ft., Sundance 4,483 ft., basal Sundance 4,627 ft., Alcova lime 4,715 ft.

MONTANA WILDCAT FAILURE

Decker, Big Horn County: National Associated Petroleum Co. 1 Dinnin-Gov't., CW½ SW SE 21-8s-41e, TD 8,282 ft., dry, Cretaceous 1,480 ft., Claggett 3,800 ft., Sussex 4,350 ft., Newcastle 7,852 ft., Dakota 8,045 ft., Lakota 8,272 ft.

NEBRASKA WILDCAT FAILURE

Imperial area, Chase County: Ryan Oil Co. 1 Kilpatrick Bros., SW SW SW 17-7n-37w, TD 3,133 ft., dry, Niobrara 1,703 ft., Ft. Hays 2,120 ft., Greenhorn 2,310 ft., Dakota 2,503 ft., Fuson 2,784 ft., Lakota 2,837 ft., Jurassic 3,091 ft.

SOUTH DAKOTA WILDCAT FAILURE

Wildcat, Meade County: Morton Oil Co. 1 Brehm, NE NE SW 4-2n-10e, TD 2,475 ft., dry, Greenhorn 1,563 ft., Mowry 2,108 ft., Muddy 2,188 ft., Dakota 2,443 ft.

Permian Basin

Pennsylvanian Test Near Midland Awaits Completion

MIDLAND. — Magnolia Petroleum Co. 1 H. F. Timmerman, Pennsylvanian discovery 11½ miles south and slightly west of Midland, made a flow of 321 bbl. of 44°-gravity oil in 19 hours, through 28/64-in. tubing choke. Gas-oil ratio on the test was 1,770 cu. ft. and flowing pressure was 690-500 psi. At last report it was still flowing to clean before making completion attempt.

The above gage followed a 13-hour flow which cleaned out 230 bbl. of load oil, without swabbing. Final jet perforations were four per foot from 10,440-85 ft. The 1 Timmerman first flowed oil on a drill-stem test of the Pennsylvanian from 10,435-10,535 ft., then was drilled ahead to 13,030 ft., total depth, had water in the Ellenburger, and was plugged back to 12,500 ft. Top of Pennsylvanian porosity was 10,449 ft., on elevation of 2,851 ft.

Location is about 3 miles southeast of the Parks Ellenburger discovery, which had shows for production in the Pennsylvanian, topped at 10,060 ft., on about the same elevation.

Magnolia 1 Collings, north offset to the Parks well, recovered drilling mud with no shows on a drill-stem test at 13,108-155 ft., and was coring ahead in Ellenburger dolomite below 13,157 ft.

Six miles northeast of Parks field, Ralph Lowe 1 Hill was drilling shale at 11,479 ft.

Garza County was commanding attention again this week at Continental Oil Co. 2 Swenson Land & Cattle Co. recovered considerable oil from a reef limestone formation, identified as the Canyon. Location is about 20 miles northeast of the town of Post.

Drill-stem test from 6,832-62 ft. had gas in 45 minutes and recovered 1,260 ft. of clean oil, and 540 ft. of heavily oil and gas-cut mud, with no water. Operators said the packer had closed in 30 minutes. The drill pipe unloaded some oil while being pulled.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Crane County: Atlantic Refining Co. 1-LL University, Blk. 31, 6-31-University Lands, 2½ mi. W Waddell field, TD 11,915 ft., PB 11,520 ft., elev. 2,645 ft., top Connell sand 11,450 ft., perf. 11,470-510 ft., IP flowed 262 bbl. 46°-grav. oil a day, natural, ½-in. choke, GOR 977 cu. ft., TP 55 psi.

Crockett County: Malco Refineries, Inc. 1 Archie Bean, 14-UV-GC&SF, 15 mi. NW Ozona, TD 1,359 ft., elev. 2,505 ft., acidized 1,353-59 ft., IP pumped 75 bbl. 26°-grav. oil a day.

Glasscock County: Hubbard S. Russell 1-20 Wrage-Hendrickson, 20-36-T3S-T&P, 2½ mi. E Tex Harvey field, TD 7,175 ft., elev. 2,574 ft., Spraberry sand pay 6,910 ft., IP flowed 184 bbl. 38°-grav. oil a day, 24/64-in. choke, GOR 883 cu. ft., TP 90 psi.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Andrews County: Anderson Prichard Oil Corp. 1 Fasken B-23, 23-40-T1N-T&P, 12 mi. SE Andrews, dry, TD 4,950 ft., elev. 2,958 ft., Grayburg 4,645 ft.

Borden County: Velma Petroleum Corp. 1 Joseph Conrad, 18-20-La Vaca Navigation Co. Sur., 5 mi. N Vincent, dry, TD 7,750 ft., elev. 2,325 ft., Spraberry 4,555 ft., Reef 6,980 ft., Strawn 7,510 ft., Strawn 7,510 ft.

Cochran County: Superior Oil Co. 1 W. W. Cameron Estate, dry, TD 11,214 ft. in pre-Cambrian, old TD 7,030 ft.

Concho County: Lamb & Ford Drilling Co. 1 Bessie Baker, Sec. 1,669, Francis

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Crockett County: Headwaters Oil Co. 1 E. H. Hunt, 2-I-GC&SF, 4 mi. M, 8 mi. S Ozona, dry, TD 3,537 ft. in sand.

Malco Refineries, Inc. 2 Archie Bean, 14-UV-GC&SF, 15 mi. NW Ozona, dry, TD 1,428 ft. in limestone.

J. B. Tubb 1 University, 5-30-University Lands, 3 mi. E Lancaster Hill field, dry, TD 1,713 ft. in sand.

Ted Weiner 1 Geo. Bean, 34-UV-GC&SF, 2 mi. NW Pikes Peak field, dry, TD 1,366 ft.

Ted Weiner 1 J. M. Shannon, 40-UV-GC&SF, 4½ mi. NE Todd Deep field, dry, TD 7,810 ft., elev. 2,584 ft., Ellenburger 7,595 ft.

Dawson County: Norwood Drilling Co. 1 F. C. Vogler, 2-36-T4N-T&P, 8 mi. S Lamesa, dry, TD 10,203 ft., elev. 2,931 ft., Spraberry 7,635 ft., Pennsylvanian 10,095 ft., by samples.

Howard County: Robert L. Wood et al 1 V. E. McMinn, 47-27-H&TC, 15 mi. NE Big Spring, dry, TD 8,180 ft., elev. 2,295 ft., top limestone 8,104 ft.

Lubbock County: M. F. C. Corp 1 John Clark, 38-AK, 6 mi. SW Lubbock, dry, TD 10,350 ft., elev. 3,299 ft., Clear Fork 5,830 ft., Strawn 10,130 ft. by samples.

Lynn County: Houston Oil Co. of Texas 1 H. B. Howell, 451-1-ELRR, 7½ mi. SE Tahoka, dry, TD 9,503 ft., PB 6,305 ft., elev. 3,033 ft., Spraberry 6,225 ft., Dean sand 7,644 ft., Canyon reef 8,996 ft., Strawn 9,320 ft.

Placid Oil Co. 1 C. F. Holland, 13-J-GW&TP, 2 mi. SW Southland, old TD 4,107 ft., dry, TD 9,012 ft., elev. 3,048 ft., Spraberry 5,550 ft., Dean sand 6,960 ft., Pennsylvanian 8,807 ft.

Ryan, Hays & Burke 1 Leon Bromberg, 486-1-ELRR, 5 mi. SE Tahoka, dry, TD 9,514 ft., elev. 3,053 ft., Spraberry 6,200 ft.

Menard County: Herbert Long 1 J. A. Leggett, Sec. 1, BS&F Sur., dry, TD 2,305 ft., elev. 2,124 ft., McCluskey sand 2,214 ft.

Mitchell County: J. S. Michael 1 Elwood, Sec. 20, J. P. Smith Sur., dry, TD 7,400 ft., elev. 2,079 ft., Ellenburger 7,214 ft.

Pecos County: George Atkins 1 C. J. Golden, 92-10-H&GN, 2 mi. SE Buena Vista, dry, TD 400 ft.

Castle & Castle 1 R. W. Arnold, 9-1-H&TC, dry, TD 1,895 ft.

Dick Dean 1 Mrs. Matt Crowley, Sec. 590, A-8,189, GC&SF, dry, TD 1,200 ft. in sand.

Hunt Oil Co. 24 Elsinore, 28-B-GC&SF, dry, TD 1,844 ft.

Reagan County: Continental Oil Co. 1 J. W. Ash, A. B. Hutchinson Sur. 4, dry, TD 5,492 ft., elev. 1,947 ft., Strawn 4,425 ft., Gardner 4,815 ft., Caddo 5,085 ft., Ellenburger 5,205 ft.

Runnels County: T. W. Murray & Gus Kennedy 1 Mrs. Helen Sherill Oliver, T. T. Williamson Sur. 491, 1½ mi. E Winters, dry, TD 4,310 ft., elev. 1,750 ft., Gardner 2,425 ft., Home Creek 3,050 ft.

Ryan Consolidated Petroleum Corp. 1 E. C. Lindeman, John J. Eakin Sur. Sur. 527, 5½ mi. N Ballinger, dry, TD 4,600 ft., elev. 1,698 ft., Gardner 3,863 ft., Caddo 4,050 ft., Ellenburger 4,526 ft.

Schleicher County: Argo Oil Corp. 1 T. C. Meador, 16-LL-TCRR, 6 mi. N Eldorado, dry, TD 7,130 ft., elev. 2,403 ft., Strawn 6,827 ft., Ellenburger 7,022 ft.

Sterling County: Humble Oil & Refining Co. 1 R. T. Foster "B," 16-T-T&P, 6 mi. SW Sterling City, dry, TD 8,680 ft., elev. 2,521 ft., San Angelo 2,130 ft., Ellenburger 8,640 ft.

Terry County: Goldston Oil Corp. 1 Auld & Johnson, 4°4X-ELRR, 3 mi. N Mound Lake field, dry, TD 10,055 ft., elev. 3,264 ft., San Andres 4,340 ft., Spraberry 6,950 ft., Dean sand 8,500 ft.

Placid Oil Co. 1 Mrs. N. E. Von Rosenberg, 41-DD-J. H. Gibson Sur., old TD 4,107 ft., dry, TD 10,532 ft., elev. 3,305 ft., Praberry 7,915 ft.

Tom Green County: J. K. Dorrance 1 C. D. and C. L. Atkins, P. H. Johnson Sur. 949½, dry, TD 3,256 ft.

SOUTHEAST NEW MEXICO

HOBBS.—Tide Water Associated Oil Co. 1-P-D State, Lea County wildcat approximately 9 miles west of Knowles Devonian

(Continued on page 167)

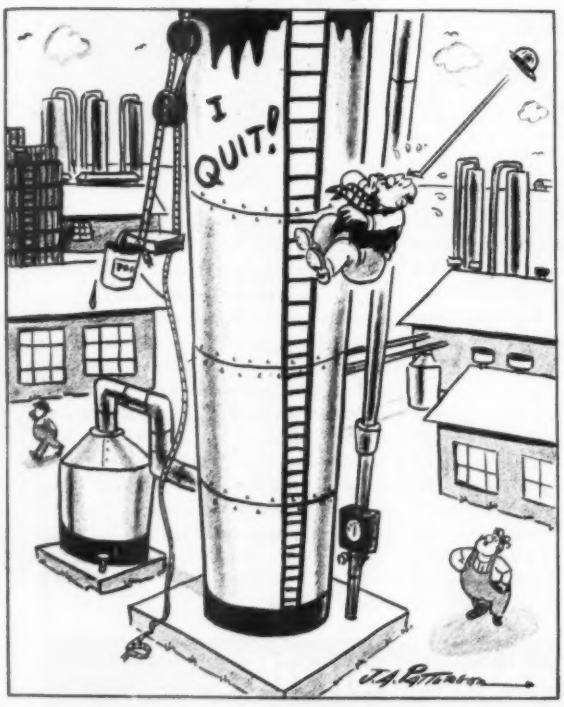
Ohio Fields

Shows Indicate Three Wells In New Castle Township

COLUMBUS.—The Preston Oil Co. 2 Edith Daliere, Section 23, New Castle Township, Coshocton County, logged the Clinton at 3,300-54 ft. with good oil showings in the lower part of the sand. After shot, the well made 60 bbl. in 24 hours. The producer is a south offset to the 1 Jas. Allen. The company is drilling in 2 Barrett in the third quarter of the same township, and shows indicate a good well. Willard Shrider et al found the Clinton at 3,238-96 ft. at 2 Perry Richards in the third quarter of New Castle Township. The well made 12 bbl. natural and will be shot.

H. G. Clymer drilled in another shallow lime-sand well in Salem Township, Washington County. On 1 Walter Thomas, Section 25, the sand was topped at 999 ft. and drilled in 10 ft. with a natural open flow of 400,000 cu. ft.

Little activity was reported again this week; roads are still in poor condition. Four new locations were reported in Ashland County and seven others scattered. Ashland field led in completions with three of seven.



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Oak Grove Proved as New Kentucky Oil Pool

R. E. HUPP and associates have completed their 1 Sawyer, NW NW NE 22-P-25, Henderson County, western Kentucky, to open the Oak Grove pool. The well, located about 10 miles southeast of Henderson and about 4 miles south of comparatively new and active Zion North pool, pumped 150 bbl. of net oil with about 15 bbl. of water per day. Production is from McClosky lime, logged at 2,312-34 ft., and opposite which casing was perforated at 2,328-30 ft., and 2,312-24 ft. Total depth is 2,338 ft., where casing was cemented. Nearest production is in the Euterpre North pool, about 1½ miles to the southeast. There also is some production in the Coraville area about 2 miles to the west.

About ¼ mile east of production in the Aden pool, Hamilton County, Illinois, Floyd & Henson and associates have completed an exceptionally good well for that area at their 1 Garrison, SW NW NE 29-3s-7e. Following a 3,000-gal. acid treatment of McClosky lime at 3,392-3,410 ft., the well flowed at the rate of 20 bbl. of oil per hour. The area is about 6 miles west of Mills Shoals and about ½ mile east of the town of Aden.

In Indiana, Ryan Oil Co. 1 Buchanan, NE NE NW 22-6s-13w, 4 miles north of Mt. Vernon, in the Bufkin area, swabbed at the rate of 196 bbl. of oil per day following a 50-qt. shot in its Aux Vases pay zone at 2,766-72 ft. The location is about a mile south of the Oliver South pool, opened earlier this year, and about a mile northwest of the Welborn pool.

Howard D. Atha 1 Hoskins, SW NW SE 36-6s-8e, ½ mile north of production in the Roland pool, White County, Illinois, swabbed 5 bbl. of oil per hour natural in initial tests of the O'Hara and Rosiclare formations, two new pay zones for the area. O'Hara saturation was logged at 2,960-66 ft. and that of the Rosiclare at 2,978-85 ft. Total depth is 3,046 ft. in McClosky lime. The producing zones are open through perforations in the casing cemented at 3,026 ft. on the McClosky.

Barron Kidd is opening a new producing area 9 miles north of Evansville, Vanderburgh County, Indiana, at his 1 Martin, NW SW NW 5-5s-11w, which swabbed about 2 bbl. net oil with 6 bbl. of water per hour natural in starting tests of Cypress sand at 2,224-38 ft. The area is about 1 mile northwest of Armstrong and about the same distance from nearest production.

ILLINOIS SUCCESSFUL WILDCATS

Edgar County: E. Zink 1 Saxton, NW NW NE 26-13n-14w, IP 33,000 cu. ft. gas, Pennsylvanian sand 400-54 ft., TD 454 ft.
Effingham County: Sun Drilling Co. 1 Lake, SE NE SW 15-6n-7e, IP 8 bbl., Cypress 2,555-61 ft., TD 2,985 ft.
Saline County: Skiles Oil Corp. 1-E Bramlett, SW NE SE 36-7s-7e, IP 63 bbl., Cypress 2,496-2,518 ft., and Aux Vases 2,800-43 ft., TD 2,846 ft.

ILLINOIS WILDCAT FAILURES

Boone County: E. H. Myers 1 Krupke, NE SW NW 33-46n-3e, dry, TD 1,555 ft.
Christian County: Werner Oil Co. 1 Townsend, SE NE SW 5-11n-1w, dry, TD 1,420 ft.
Clay County: Davis & Johnson 1 Leavitt, NE NE SW 22-4n-8e, dry, TD 3,129 ft.
Miami Operators 1 Tanner & Busse, SW SW SW 14-4n-6e, dry, TD 3,009 ft.
Skiles Oil Corp. 1 Hinterscher-Keffler, NE SE SW 4-4n-8e, dry, TD 2,978 ft.
Edgar County: M. L. Livengood 1 Perisho, SW SW SE 35-14n-13w, dry, TD 1,378 ft.
Franklin County: W. J. McGlasson 1 Steins, C E½ NW SW 13-7s-4e, dry, TD 3,220 ft.
Gallatin County: J. W. Everhart 1 Bruce, SE SE NW 6-8s-8e, dry, TD 2,975 ft.
A. Valters 1 Wilson, SW SE NE 3-9s-9e, dry, TD 2,922 ft.
Hamilton County: Dale Hopkins 1 Flanigan-Porter, SW SE SE 7-4s-7e, dry, TD 3,478 ft.
Mark Twain Oil Producing Co. 1 Hall, SE SE SW 23-4s-5e, dry, TD 3,460 ft.
Madison County: Spade Drilling Co. 1 Korsmeyer, SW SW SE 33-6n-5w, dry, TD 666 ft.
Menard County: Contine & Haley 1 Johnson, NE SW SW 24-19n-5w, dry, TD 1,560 ft.
Perry County: Perrine & Perrine 1 Thornton, SE SE SE 5-4s-4w, dry, TD 3,000 ft.
Richland County: W. H. Bears et al., 1 Rexroat, NE NE NE 18-3n-14w, dry, TD 3,250 ft.
P. Fulk 1 Long, NW SW NW 17-2n-9e, dry, TD 3,092 ft.
P. Fulk 1 Rule, SW SE NW 8-2n-9e, dry, TD 3,119 ft.

INDIANA WILDCAT FAILURE

Marshall County: C. W. Kendall 1 Miller, SW NW SE 11-34n-2e, dry, TD 405 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Henderson County: R. E. Hupp et al., 1 Sawyer, NW NW NE 22-P-25, IP 150 bbl., McClosky 2,312-34 ft., TD 2,338 ft.

WESTERN KENTUCKY WILDCAT FAILURE

Union County: A. W. Cherry et al., 1 Waller, SW SW SW SW 20-O-17, dry, TD 2,779 ft.

EASTERN KENTUCKY

ASHLAND.—In Fleming County, 20-V-70, Walter Kline et al are drilling ahead at 1,625 ft. on 1 James Bashford. Drilling in the Knox dolomite as they are, this test represents the only one in eastern Kentucky that is currently exploring the Cambro-Ordovician formations.

In Greenup County, 3-Y-79, Dixie King Coal Co. is drilling at 525 ft. on 1 Wain Boggs. This is currently the only wildcat drilling in this county and is designed to test down to possibly through the Devonian-Silurian sediments.

Louisiana-Arkansas

DeSoto Parish May Get New Austin Chalk Pool

SHREVEPORT.—Southern DeSoto Parish has prospects of a new productive area between Benson and Trenton pools. J. F. Lent 1 Walker, Section 20-11n-13w, ran a drill-stem test in the Austin chalk and recovered 120 ft. of oil, gas, and oil-cut mud with no water. The tool was open 30 minutes, with packer set at 2,640 ft. Total depth is 2,700 ft.

Skelly Oil Co. and Sunray Oil Corp. recovered 34.5°-gravity oil on drill-stem tests at their 1 J. L. Lewis in Athens gas-distillate field in Claiborne Parish. Located in Section 20-20-6w, the well had three tests in the Hosston formation with the following recovery on each: gas in 55 minutes and 55 bbl. of oil in 3 hours on test at 7,402-7,506 ft.; 1,600 ft. of oil and 450 ft. of oil and gas-cut mud at 7,496-7,506 ft.; last test of perforations at 6,192-6,202 ft. and 6,226-36 ft. had gas in 4 hours, 10 ft. of water, and 5 ft. of distillate.

Arkansas.—C. H. Murphy & Co. and McAlester Fuel Co. are preparing for final tests at their 1 Longing, NW SW 28-19s-18w, Union County. Located in Tubal field, the well showed for production in only one pay zone of the dual-producing field. The pool opener, Murphy and McAlester 1 Gregory, SE SW 28-19s-18w, and the team's second wells, Concannon (across the Columbia County line), both produce from the Cotton Valley and Smackover. The 1 Longing found no encouragement in the first zone, and will attempt to complete successfully in the Smackover where slight shows of oil, gas, and distillate were recovered at 9,278-9,300 ft.

In the same county, possible new pay was indicated for East Schuler field at Kinard 1 Burns, SW NE SW 13-18s-17w. Cores taken at 5,750 ft. in the Cotton Valley had a good show of oil. The field produces from the shallower Morgan sand. The well is currently below 6,250 ft., and operator plans to drill to the Smackover expected around 7,700 ft.

NORTH LOUISIANA SUCCESSFUL WILDCAT

Concordia Parish: Sinclair Oil & Gas 1 R. B. Sharp, 10-4n-9e, flowed 268 bbl. 43.9°-gravity oil per day, perf. Wilcox at 6,697-6,708 ft., TD 7,496 ft., TP 675 psi., GOR 306 cu. ft.

(Continued on page 167)

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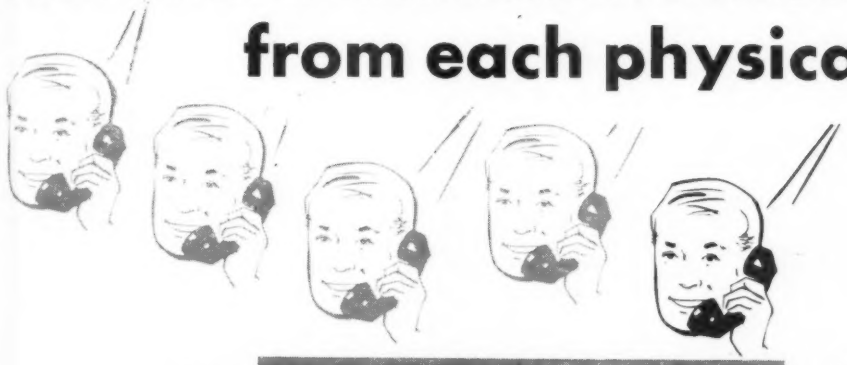

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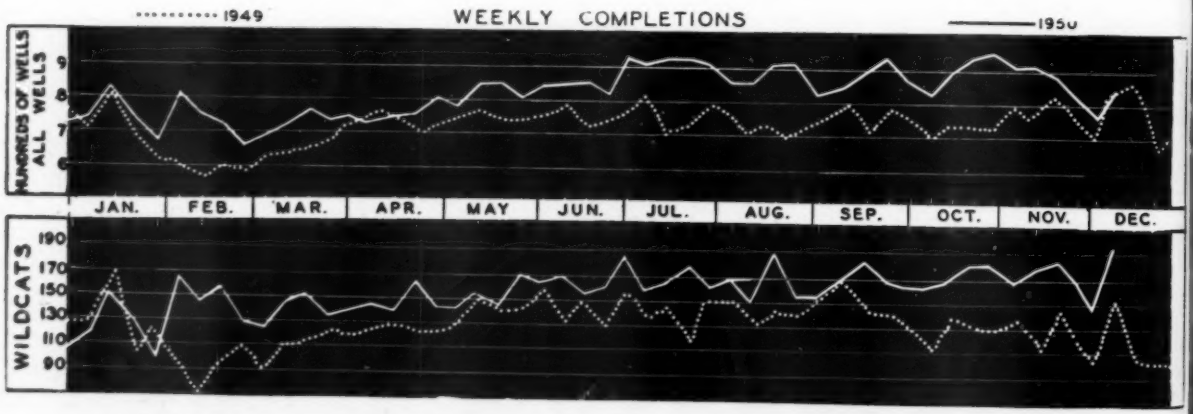
CURRENT STATISTICS

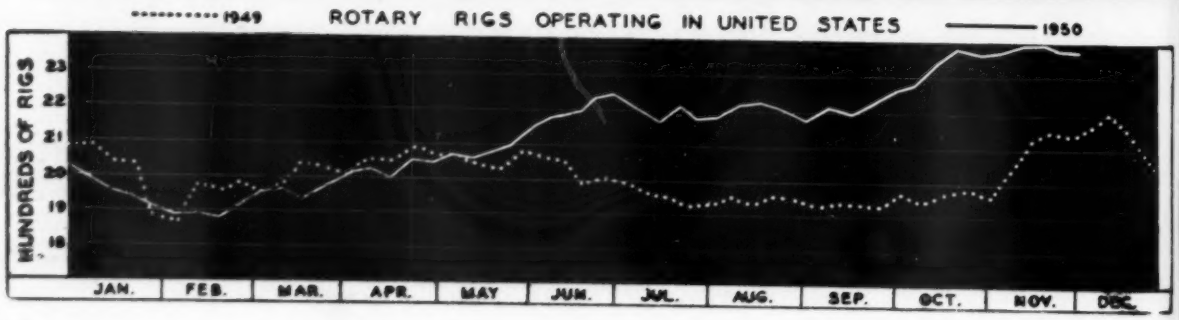
EXPLORATION

WEEKLY WELL COMPLETIONS . . . . . WEEK ENDED DECEMBER 9, 1950

	Total of all wells					Dec. 9		Wildcat completions and discoveries									
													Cumulative total, 1950				
	Comp.	Oil	Gas	Dry	Footage	1950	1949	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	5	3	0	*2	6,440	632	884	0	0	0	0	0	0	0	0	0	0
Pennsylvania	12	5	2	†5	18,953	1,253	1,476	0	0	0	0	0	0	0	1	3	4
West Virginia	19	2	10	7	47,140	621	490	0	0	3	1	4	0	0	24	20	44
Ohio	7	2	2	‡3	15,794	972	1,049	0	0	0	0	0	2	0	2	15	19
Indiana	21	6	0	15	34,272	1,529	1,275	0	0	0	1	1	53	0	2	244	299
Kentucky	25	13	6	6	49,084	1,111	976	1	0	0	1	2	27	0	1	91	119
Illinois	63	16	3	44	154,017	2,709	2,541	2	0	1	17	20	54	0	4	587	645
Michigan	14	6	2	6	40,500	840	953	0	0	0	6	6	33	0	6	288	327
Kansas	57	31	2	§24	194,999	3,670	3,143	4	0	1	13	18	107	0	13	614	734
Nebraska	4	2	0	2	12,604	134	33	1	0	0	1	2	8	0	4	58	70
Oklahoma	93	62	3	†28	306,560	5,138	4,099	2	0	0	5	7	148	6	19	621	794
Texas	371	230	7	134	1,705,096	15,557	12,724	8	1	1	90	100	481	46	107	2,563	3,197
North Central (Dist. 7-B & 9)	93	48	2	†43	268,531	4,720	4,242	1	0	1	29	31	209	2	30	996	1,237
West (Dist. 7-C & 8)	144	104	0	40	792,141	4,695	3,110	3	0	0	29	32	93	3	6	517	619
Panhandle (Dist. 10)	14	12	1	1	42,444	841	913	0	0	0	0	0	1	0	2	19	22
Eastern (Dist. 5, 6, & 6-P)	18	12	0	6	85,691	1,080	820	1	0	0	3	4	16	6	3	188	213
Gulf Coast (Dist. 2 & 3)	46	25	2	19	250,910	2,188	1,871	0	1	0	14	15	79	22	41	388	530
Southwest (Dist. 1 & 4)	56	29	2	25	265,379	2,032	1,768	3	0	0	15	18	83	13	25	455	576
Louisiana	60	38	8	14	343,773	2,311	2,221	1	0	0	7	8	48	16	6	212	282
Northern	32	21	4	7	107,723	1,242	1,346	1	0	0	3	4	14	3	2	108	127
Southern	28	17	4	7	236,050	1,069	878	0	0	0	4	4	34	13	4	104	155
Arkansas	3	2	0	1	13,603	380	313	0	0	0	1	1	10	0	0	84	94
Mississippi	6	3	0	3	44,091	292	320	1	0	0	2	3	11	2	0	110	123
Southeastern States	0	0	0	0	0	56	46	0	0	0	0	0	1	0	1	30	32
Montana	0	0	0	0	0	246	239	0	0	0	0	0	2	0	0	43	45
Wyoming	12	8	0	4	66,904	568	563	0	0	0	1	1	23	0	1	90	114
Colorado-Utah	1	0	1	0	7,919	106	132	0	0	1	0	1	6	0	4	61	71
New Mexico	11	7	0	4	61,878	573	479	0	0	0	4	4	11	1	3	55	70
California	57	39	2	16	240,797	1,725	2,426	0	0	0	14	14	29	0	4	368	401
Miscellaneous (So. Dak.)	1	0	0	1	2,475	52	26	0	0	0	1	1	0	0	0	27	27
Total United States	842	475	48	319	3,366,899	40,475	36,411	20	1	7	165	193	1,054	71	202	6,184	7,511
Total previous week	765	425	38	302	2,895,486			13	2	2	130	147	1,034	70	195	6,019	7,318
Total December 9, 1949	835	485	60	290	2,932,601			19	5	4	125	153	880	80	182	5,266	6,408

Service wells included: *2, †5, ‡1, §3.





DAILY AVERAGE PRODUCTION FOR WEEK

	Dec. 9 crude oil	B. of M. Dec. demand	Dec. 2 crude oil
Alabama	2,400	2,400	2,400
Arkansas	81,650	88,000	81,350
California	963,800	955,000	954,200
Colorado	75,800	67,000	77,400
Eastern	52,000	67,000	56,000
Florida	1,550	1,600	1,475
Illinois	168,300	180,000	169,500
Indiana	30,700	31,000	29,900
Kansas	313,100	306,000	294,650
Kentucky	31,400	31,000	28,800
Louisiana	590,500	610,000	584,625
North Louisiana	114,550		114,350
South Louisiana	475,950		470,275
Michigan	43,200	47,000	44,100
Mississippi	104,150	112,000	104,850
Montana	22,500	24,000	22,500
Nebraska	5,500	6,000	5,500
New Mexico	130,800	142,000	130,900
Oklahoma	492,750	468,000	494,400
Texas	2,375,425	2,380,000	2,495,500
Dist. 1 (Southwest)	31,000		31,150
Dist. 2 (Southwest)	141,350		146,625
Dist. 4 (Southwest)	218,375		225,800
Dist. 3 (Gulf Coast)	425,700		438,375
Dist. 5 (Eastern)	40,075		42,050
Dist. 6 (Eastern)	92,150		96,375
East Texas field	269,700		284,900
Dist. 7-C (West)	71,825		71,550
Dist. 8 (West)	773,400		847,050
Dist. 7-B (W. Central)	72,650		72,100
Dist. 9 (N. Central)	149,200		149,525
Dist. 10 (Panhandle)	90,000		90,000
Utah	3,300	4,000	3,400
Wyoming	177,200	183,000	178,900
Total United States	*5,666,025	5,710,000	5,760,350
Change from prev. week, down	94,325		
Canada	96,305		102,225

Total U. S. production January 1-December 9 †1,854,812,015 bbl.

Same period last year (crude plus cond.) 1,741,583,310 bbl.

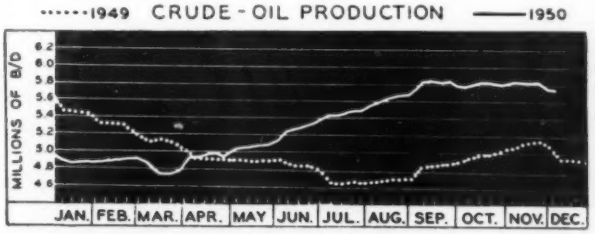
*Not including 102,145 bbl. condensate. †Including 33,528,810 bbl. condensate.

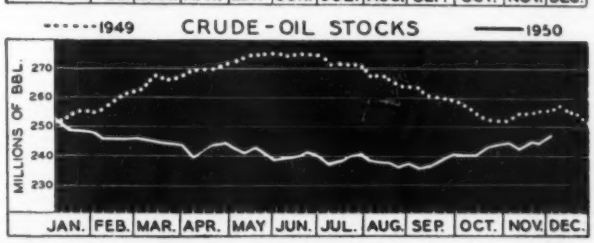
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

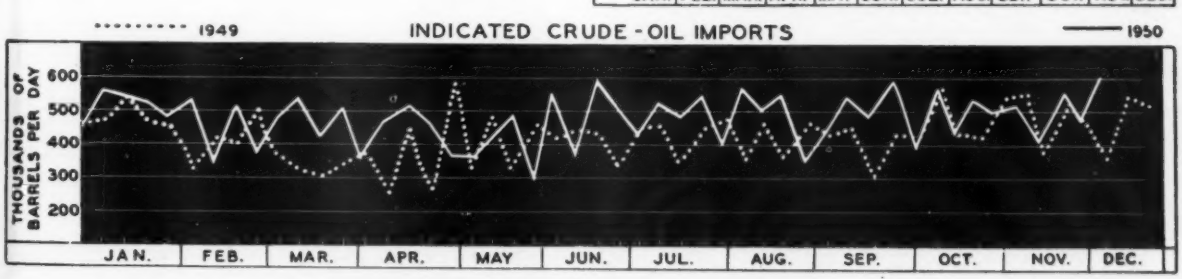
(Thousands of barrels)

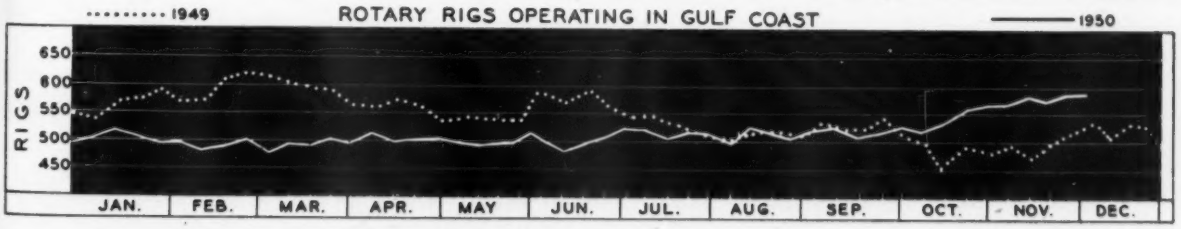
	Dec. 2, 1950	Nov. 25, 1950	Dec. 3, 1949
Pennsylvania Grade	2,097	2,221	2,973
Other Appalachian	1,233	1,343	2,014
Illinois, Indiana, Michigan	10,419	10,334	11,778
Arkansas	2,383	2,507	2,694
Louisiana	13,888	14,373	13,944
North	2,810	2,801	3,172
Gulf	11,078	11,572	10,772
Mississippi	2,128	2,053	2,593
New Mexico	7,067	6,876	7,191
Oklahoma and Kansas	38,262	38,103	37,290
Texas	121,516	118,440	119,308
East Texas	14,542	13,830	17,288
West Texas	47,342	46,556	44,086
Texas Gulf	29,604	28,711	30,766
Other Texas	30,028	29,343	27,168
Rocky Mountain	11,221	11,398	13,935
California	30,576	30,235	37,586
Foreign	6,957	6,609	7,183
Total	247,747	244,497	258,489

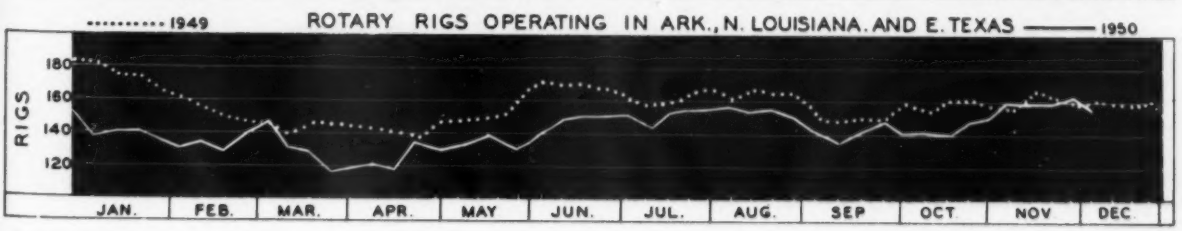
*Bureau of Mines









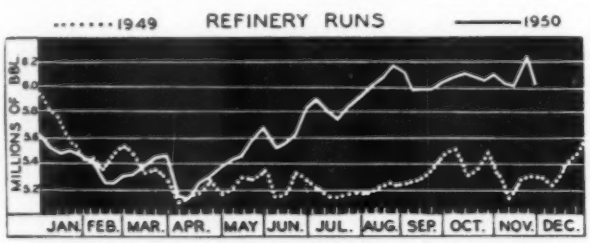

1949 ROTARY RIGS OPERATING IN ARK., N. LOUISIANA, AND E. TEXAS 1950
RIGS
180
160
140
120
JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP OCT NOV DEC

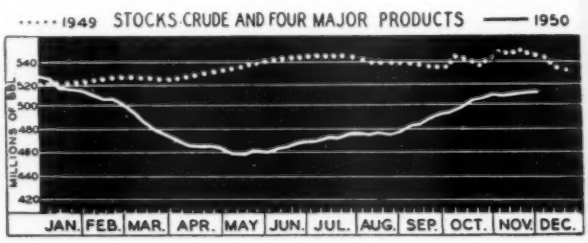
A.P.I. REFINERY REPORT, DECEMBER 2

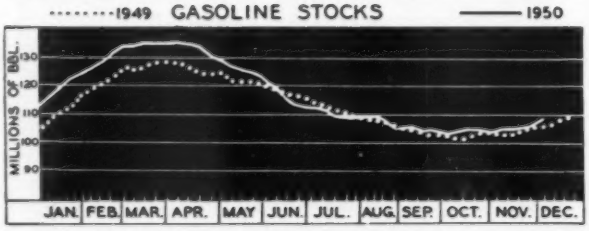
(Thousands of barrels)

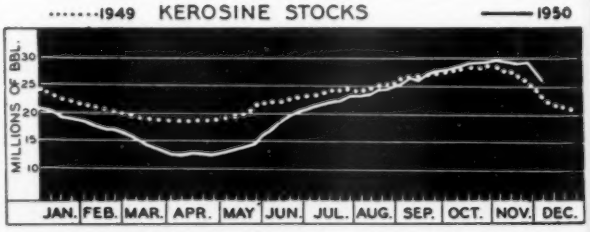
District—	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline†	Kerosine	Distillate	Residual	Bureau of Mines, December 1949: Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	873	314.0	41.6	215.1	197.3	24,580	10,206	27,667	11,371	854	345.8	38.5	197.8	214.8
Appalachian:														
District 1	90	43.9	6.9	11.9	10.4	2,957	465	941	442	95	44.2	6.3	14.7	13.4
District 2	63	24.4	2.4	7.0	13.9	1,211	218	266	206	63	32.0	5.3	8.1	14.1
Ind., Ill., Ky.	1,127	590.6	70.9	195.4	174.3	22,954	5,718	13,825	4,857	967	500.1	63.1	170.5	174.7
Okla., Kans., Mo.	523	269.1	19.3	104.0	58.9	11,014	1,358	8,990	1,318	437	242.0	18.1	86.3	59.7
Inland Texas	203	143.6	8.4	34.9	35.6	3,596	480	1,291	630	198	137.7	12.9	23.9	39.5
Texas Gulf Coast	1,420	683.2	163.6	353.8	236.7	16,303	3,783	13,872	6,092	1,324	610.5	114.6	285.8	245.9
La. Gulf Coast	487	240.0	53.4	117.7	73.1	6,786	2,522	3,990	2,436	455	231.4	63.1	88.5	64.4
N. La. and Ark.	71	30.4	7.1	15.4	7.4	2,336	359	844	166	72	31.0	7.0	12.1	15.7
Rocky Mountain:														
New Mexico	15	7.7	.4	2.9	3.9	87	25	40	33	13	7.2	.5	1.8	3.2
Other Rocky Mtn.	206	93.3	9.4	37.9	48.1	2,942	340	1,767	776	174	85.2	5.9	32.5	34.1
California	956	405.1	13.9	134.4	357.7	14,741	817	11,398	16,894	823	365.5	11.6	110.3	323.2
December 2, 1950	6,034	2,845.3	397.3	1,230.4	1,217.3	109,509	26,291	84,891	45,221	5,475	2,632.6	346.9	1,032.3	1,202.7
November 25, 1950	6,238	2,835.3	340.8	1,227.3	1,210.0	106,424	28,291	86,768	45,566	.....	.....	.....	.....	.....
December 3, 1949	5,329	2,589.7	315.6	966.6	1,191.7	105,264	25,151	89,448	66,271	.....	.....	.....	.....	.....

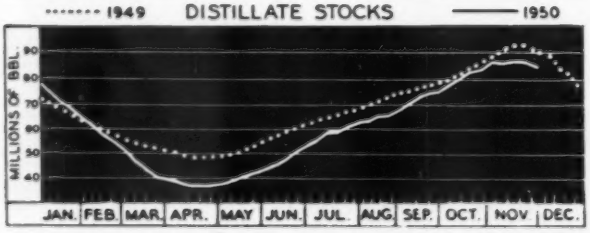
*At refineries including natural blended. †Finished and unfinished.

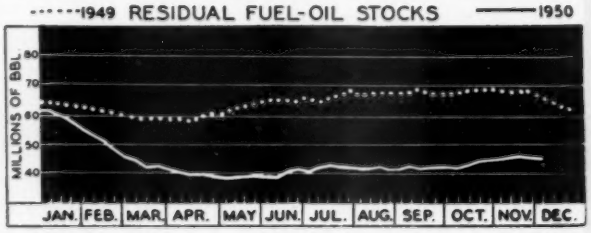


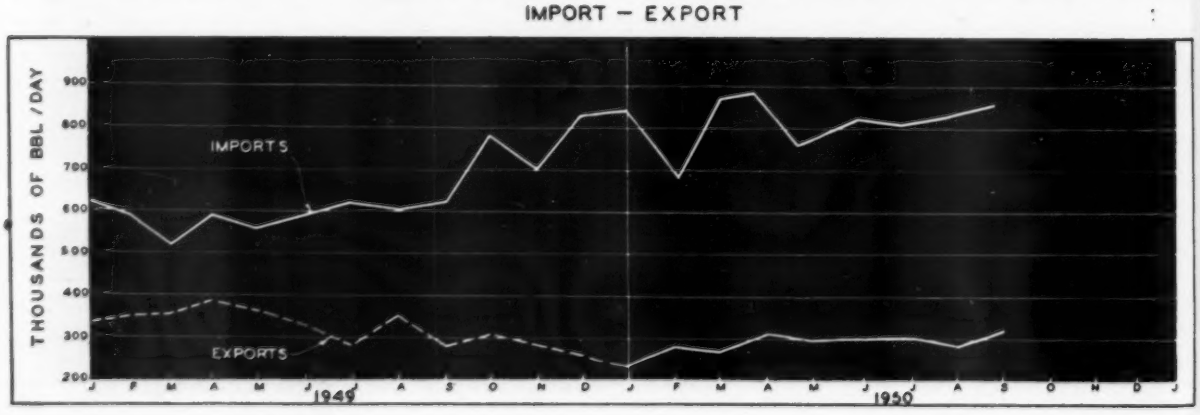












CRUDE PRICES
GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.76	....	....	....
19-19.9	1.83	....	....	....
20-20.9	1.90	$2.25	....	$2.12
21-21.9	1.97	2.27	....	2.14
22-22.9	2.04	2.29	....	2.16
23-23.9	2.10	2.31	....	2.18
24-24.9	2.17	2.33	$2.56	2.20
25-25.9	2.24	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	4.25
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

COLD weather in most areas in the North and East has resulted in firmer markets for both light and heavy fuel oils. In the Mid-Continent area Group 3 prices for kerosine and No. 2 fuel were up .125 cent a gallon on the low with more and more buyers in the market. In many cases suppliers in areas of Texas where sales are generally made on the Group 3 market were asking and getting the Group 3 low f.o.b. plants despite the normal freight differential.

Interruptions in gas supply at public-service and large industrial plants in many middle western states, due to increases in home consumption, resulted in shifts to heavy fuel. Many of these plants are in the Mid-Continent spot market to meet needs above normal contract amounts and to keep tanks filled.

Railroads are taking heavy fuel at $1.65 a barrel but this can hardly be considered a spot-market price even though the contracts are on a monthly basis. Open-market material is unavailable at less than $1.70 since demand within the area is absorbing most of the supply above contract commitments at prices that will net back at least that much to the refiner.

Weather conditions have also caused reductions in gasoline demand and some softening in the gasoline market, particularly in the Mid-Continent. High tanker rates will prevent price reductions on the East Coast unless excess supplies on the Gulf Coast soften that market.

East Coast fuel supplies are closely held with very few deliveries other than to contract accounts since replacement costs are well above quoted lows in New York Harbor.

Continuing high demand for lubricating oils has resulted in another increase in Pennsylvania Grade crude-oil prices. The latest increase was for 15 cents a barrel, bringing Bradford crude to $4.25.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotation of leading suppliers as of December 11, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅛-10½	12.5-12.75	10¾-11
Premium gasoline, 86-88 octane	11⅛-11½	13.5-13.75	11½-12
42-44 w.w. kerosine	9-9⅛	10-10.1	8½-9
No. 2 straw fuel oil	8¼-8½	9-9.2	7½-8
No. 6 residual	$1.70-1.75	$2.15-2.30	$1.75-1.85

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6⅜	5⅞	6⅛
Grade 18-55	7.65	7.15	7.4

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	12.5-13.5
750 vis., No. 3-4 neutral	14.75-16
2,000 No. 5-6 neutral	16.5-19

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock 0-10 pp.	27-28
200 vis., No. 3 neutral, 0-10 pp.	16.5-18.5

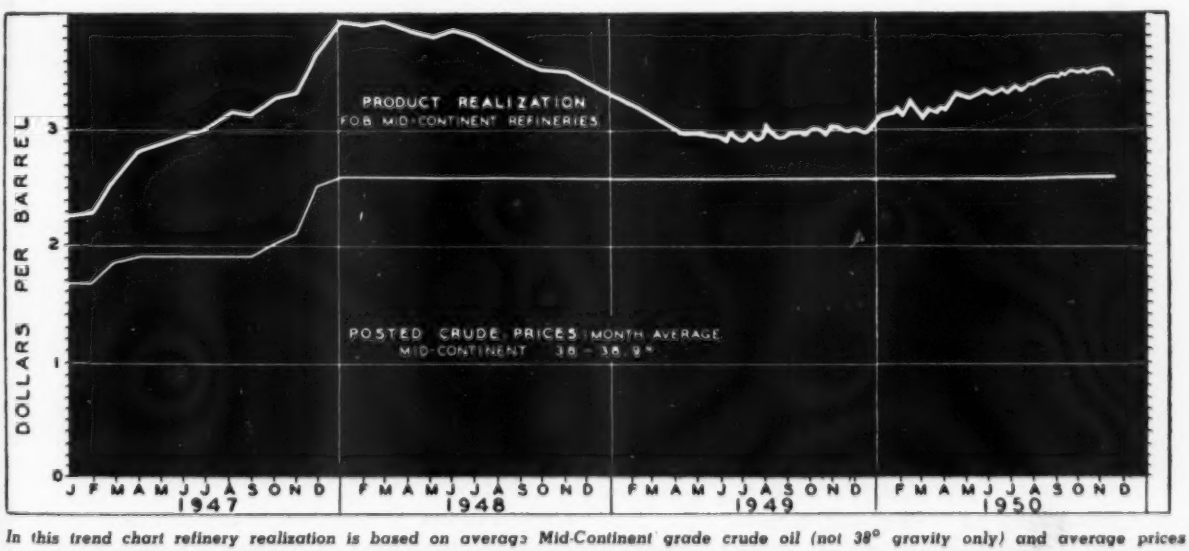
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	31.5
180 vis., 0 p.t. neutral	30.5

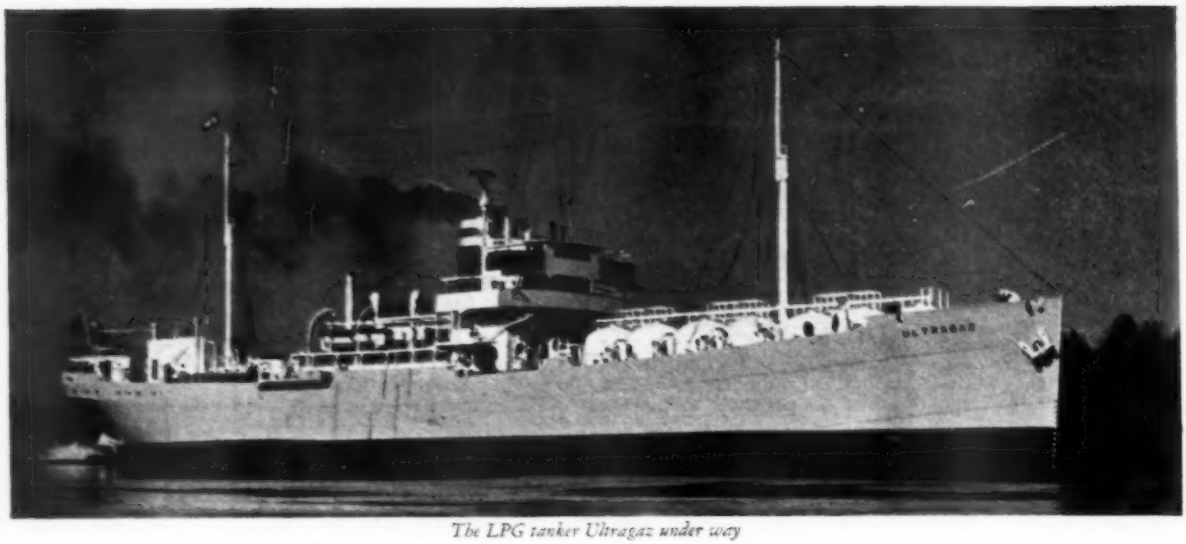
WAX

Mid-Continent

132-134 A.M.P.	5.0



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.45 for week ended December 2, $3.49 for previous week, and $3.08 for December 1949.



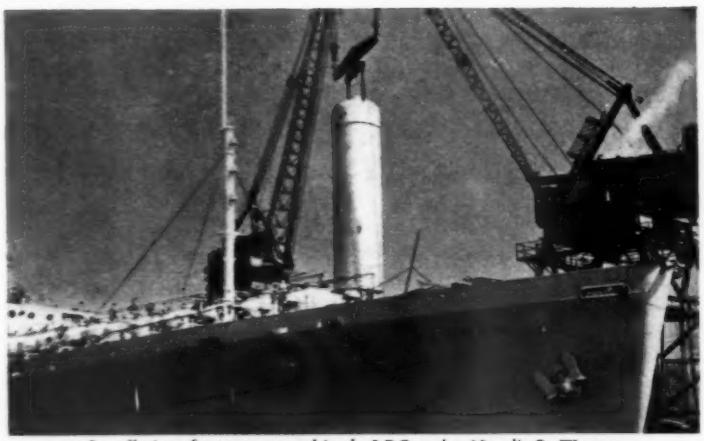
The LPG tanker Ultragaz under way

Liquefied Petroleum Gas Tankers by BETHLEHEM for MAXIMUM Economy Efficiency Safety

The *S. S. Natalie O. Warren* and the *S. S. Ultragaz*, converted at Bethlehem's Beaumont Yard from dry cargo vessels to liquefied petroleum gas tankers, represent the most economical and safest means yet developed for the transportation of bulk propane and butane gases.

They also reflect Bethlehem's ability to design and construct or convert varied craft for the most efficient mass movement of special liquid cargoes over *the oceans or on inland waterways.*

If you are a bulk shipper of special liquid cargoes we would be pleased to show you some of the economic, safety, and control advantages of transportation by specialized ships and barges. Your inquiry will be welcomed by Bethlehem —the nation's outstanding pioneer in the development of economical waterborne transport mediums for petroleum and its products.



Installation of a pressure vessel in the LPG tanker Natalie O. Warren

The Trade-Mark

of Dependability

SHIP REPAIR YARDS

Boston Harbor	New York Harbor
Baltimore Harbor	Beaumont, Texas
Los Angeles Harbor	San Francisco Harbor

SHIPBUILDING YARDS

Quincy, Mass.	Staten Island, N. Y.
Sparrows Point, Md.	Beaumont, Texas
Terminal Island, Calif.	San Francisco, Calif.

SHIPBUILDERS **SHIP REPAIRERS**

BETHLEHEM STEEL COMPANY

Shipbuilding Division

General Offices: 25 Broadway, New York 4, N. Y.

On the Pacific Coast shipbuilding and ship repairing are performed by the Shipbuilding Division of Bethlehem Pacific Coast Steel Corporation

EQUIPMENT MEN . . . in the News

Van Houten to Sell for Koehring in South America

G. VAN HOUTEN

George Van Houten has been appointed South American sales representative for the Koehring Co., of Milwaukee, according to a recent company announcement. With headquarters in Bogota, Van Houten will be in constant contact with distributors of the complete line of heavy-duty construction equipment manufactured by Koehring. He also will represent LeRoi Co. of Milwaukee on a similar basis. After spending 3 months at the home offices and factories of both companies, Van Houten will return to South America with a thorough knowledge of the sales and service features of both Koehring and LeRoi products.

Fort Worth Advertising Agency Changes Name

Fort Worth's oldest advertising agency, Albert Evans Advertising, has recently changed its name to Evans & Associates. The firm was established in 1924 and since that time has built a long record of continuous service to industrial advertisers.

The change in name reflects the progress of the advertising firm away from a small group centered around one individual, and toward an organized team of men and women.

Stewart & Stevenson Shows British Oilfield Engines

Stewart & Stevenson Services was host this week in Houston to a traveling industrial exhibit of one of Great Britain's leading manufacturers, British Oilfield Engines, Inc., manufacturers of Petter diesel engines.

Petter diesel engine, distributed in Texas by Stewart & Stevenson Services, was the featured product in the special industrial exhibit prepared in England and shipped complete to the United States.

The addition of the Petter line of small diesel engines, ranging from 5 to 36 hp., by Stewart & Stevenson, is intended to fill Texas power needs below the horsepower range of the General Motors Diesels.

Petter diesel engines are especially adaptable to the needs of the oil fields, pumping service, light plants, and generator sets for auxiliary purposes. Complete parts and service are available throughout Texas through Stewart & Stevenson Services points.

Lee C. Moore Reorganizes Sales Organization

H. J. Woolslayer, vice president of Lee C. Moore Corp., has announced the appointment of O. H. Dittmer as division sales manager in charge of the Oklahoma, Kansas, Illinois, and Rocky Mountain areas.

Appointment of Dittmer was the first step in the reorganization of the sales setup. Dittmer was employed by the Cosden Oil & Gas Co. in Tulsa before joining Lee C. Moore in 1922.

O. H. DITTMER

M. L. ENEFF

R. N. STORER

DON TODD

With offices in Tulsa, Dittmer will be assisted by three newly appointed sales representatives.

With headquarters in Great Bend, Kans., Marion L. Eneff will cover the Kansas and Rocky Mountain areas. Eneff started to work with the Lee C. Moore organization in 1945 as a warehouseman.

R. N. Storer, a Lee C. Moore employe since 1942, will cover the Illinois, Indiana, and Kentucky areas from his headquarters in Centralia, Ill.

Appointed to cover the Oklahoma territory with headquarters in Tulsa is Don Todd. Todd has come up through the material control and purchasing departments of Lee C. Moore since joining the company in 1946.

Geisler Joins Fisher Staff As Petroleum Engineer

J. W. GEISLER

J. William Geisler has recently joined the Pittsburgh staff of Fisher Scientific Co. as petroleum apparatus engineer.

Manufacturer of laboratory equipment and chemicals, Fisher has recently acquired the Tagliabue line of petroleum-testing equipment. Geisler will advise on related matters of engineering, manufacture, and distribution. These instruments are now manufactured in Fisher's Pittsburgh shops and are distributed through the five Fisher plants and through authorized dealers under the registered trade name of "Fisher-Tag."

Geisler has over 13 years of experience in the petroleum field. Formerly he was associated with the U. S. Bureau of Mines, Bruceton, Pa., where he did research and development on synthetic and liquid fuels. Prior to this he was with Gulf Oil Corp. and Duquesne Light Co. of Pittsburgh.

Cook to Manage Strata-Crete Sales Division

R. M. COOK

Robert M. Cook has been appointed manager of the newly organized Strata-Crete sales division of Great Lakes Carbon Corp. This announcement, made by Henry L. Walker, Jr., executive vice president, is to be effective immediately. Cook, well-known figure in the oil industry, will initially handle two newly developed products for use in the oil field: Strata-Crete and Strata-Seal. Strata-Crete is a lightweight material for use in oil-well cementing. Strata-Seal is a lightweight additive for drilling muds to combat lost circulation. Cook will be entirely responsible for the organization of a sales force to contact with major oil companies, drilling contractors, cementing companies, mud-service companies, and other factors in the oil industry.

For the past 7 years, Cook was vice president and general sales manager

XUM

of Security Engineering Co., Inc. Previous to that he was general sales manager of McCullough Tool Co. and before that was vice president and general manager of International Cementers, Inc.

National Supply Boosts Myers at Torrance Plant

National Supply Co. has announced the appointment of Corbin H. Myers as superintendent of industrial engineering at National Supply's Torrance, Calif., plant. At the same time the company announced that David M. Sowle has been made superintendent of industrial relations, also at Torrance.

C. H. MYERS

D. M. SOWLE

Myers, a graduate of University of Cincinnati, joined National Supply in 1947 as an industrial engineer after several years' experience in the industrial-engineering field. Prior to his recent appointment he was supervisor of the standards department.

Sowle attended University of Wisconsin and University of California. He came to National Supply's Torrance plant in 1946 as an industrial-relations analyst and was promoted to employment manager in 1948.

Owen, Mink Named by Gar Wood to Manage Regions

Gar Wood Industries, Inc., Wayne, Mich., has appointed Robert E. Owen as district manager in the Southwest region and Dwight L. Mink as district manager in the Midwest region. Both men will be responsible for the sale and service of Wayne Division hydraulic hoists, dump bodies, winches, cranes, and load packers in his respective region.

The Southwest region of which Owen is district manager consists of the states of Texas, New Mexico, Oklahoma, Kansas, the western half of Missouri, and the state of Arkansas with the exception of 12 eastern counties.

The Midwest region of which Mink is district manager consists of the states of Wisconsin, Illinois, Kentucky, the Upper Peninsula of Michigan, southwestern Ohio; eastern half of Missouri, southeastern Iowa, and Indiana with the exception of the northeast corner of the state.

Baroid Will Move General Offices to Houston in 1951

The general offices of the Baroid Sales Division of National Lead Co., including the sales, administrative, and research departments, will be moved in 1951 from the Los Angeles headquarters to Houston. The Baroid division is a maker of products for drilling muds used in connection with the drilling of oil wells.

Contracts have been let to construct a 40,000 sq. ft., steel and concrete two-story headquarters building in Houston, with completion scheduled for July 1 occupancy. Houston has been headquarters for Baroid's Gulf Coast division.

Childers Names Gary as Advertising Manager

A. C. GARY

Alfred C. Gary has been appointed advertising manager of Childers Manufacturing Co., Houston, according to an announcement by Robert A. Childers, president.

Gary, formerly in the advertising department of the Houston Chronicle, is a graduate of University of Texas and has done extensive production and sales work in direct mail, radio, and newspaper advertising. Childers is a manufacturer of industrial pipe jacketing and other aluminum products.

Mahoney to Manage New Ladish Branch at Tulsa

Ladish Co., Cudahy, Wis., manufacturer of a complete line of forged and seamless welding pipe fittings, has announced the establishment of a branch office at Tulsa. The office is under the managership of G. E. Mahoney who for the past 3 years has served as district manager for Ladish at Chicago.

Simultaneously Ladish announced the appointment of W. H. (Bill) Heckenberg as district manager.

Miller to Manage Sier-Bath Gear Coupling Sales

R. A. MILLER

Robert A. Miller has been appointed sales manager, Gear Coupling Division, Sier-Bath Gear & Pump Co., Inc., North Bergen, N. J.

Miller, previously advertising manager for the company and assistant sales manager of the coupling division, is now in charge of appointing representatives for the company's new line of flexible gear couplings.

Halliburton Conducts Safety Training Course

Coming in from 20 states and Canada, 120 key field representatives of Halliburton Oil Well Cementing Co. have begun a supervisor training course at Duncan, Okla., Halliburton's home office. Conducting the course is D. A. Weaver, Institute of Public Safety of Pennsylvania State College, State College, Pa.

First of its kind conducted by Halliburton, the course emphasizes: field and shop safety through selection of reliable personnel and effective training methods; better employe and customer relations; modern supervisory practices; and improved efficiency resulting from streamlined operations.

W. I. Kent, Magnolia Petroleum Co.'s safety director, Dallas, participates in the course also.

Mountain Iron & Supply to Open Great Bend Store

S. O. (Bud) Beren, vice president, Mountain Iron & Supply Co., has announced that construction is virtually complete on this $70,000 store at Great Bend, Kans. J. B. Morris will be its manager.

International Petroleum Consultants Group Formed

Members of International Petroleum Consultants, Ltd., at the ground breaking of the new addition to the Petroleum Consultants Building in Pasadena, Calif. Left to right: James B. Christie, Dr. Rene Engel, Charles R. Dodson, Florent H. Bailly, Dr. Hans E. Thalmann and John F. Dodge.

An organization has recently been formed in Pasadena, Calif., known as International Petroleum Consultants, Ltd., with headquarters in the Petroleum Consultants Building.

The principal figure back of International Petroleum Consultants, is Florent Houlding Bailly, geologist and petroleum engineer. Bailly, a graduate of California Institute of Technology, was made president of Pantepec Oil Co. of Venezuela and its companion company, Pancoastal Oil Co., C. A. of Venezuela in 1949. He also organized four service companies which are under the technical direction of the International Petroleum Consultants organization. These are Petroleum Engineering Associates, and Oil Properties Consultants of Pasadena. Petroleum Industry Consultants, C. A., Caracas, Venezuela, and Geological Engineering Consultants of Cuba.

Other members of International Petroleum Consultants include: John F. Dodge, petroleum engineer and consultant; Dr. Rene Engel, Ph.D., consulting geologist, geochemist and engineer; Dr. Hans E. Thalmann, Ph.D. in geology, petroleum geologist, stratigrapher and micropaleontologist; Charles R. Dodson, professor of petroleum engineering at University of Southern California; and James B. Christie, engineer and patent counsel.

Brogan, Matthews Buy Assets of Green Head

Paul Snetcher, of Oklahoma City, has announced the sale of the remaining physical assets of Green Head Supply Co. to Charles Brogan and Chet Matthews, who will operate the business as a partnership, under the name of Green Head Service.

Brogan and Matthews were associated with Green Head for many years prior to the sale of the company to Mid-Continent Supply Co.

Snetcher recently purchased the capital stock of Drilling Equipment Manufacturing Co., of Oklahoma City, to which he expects to devote the major part of his time in the future.

Durkee Joints Autocon Engineering Staff

P. A. Durkee has joined the engineering staff of Automatic Control of St. Paul, according to a recent announcement.

Formerly with Industrial Tool & Die Co. and Electric Machinery Manufacturing Co., Durkee will serve as electrical engineer in the liquid-level control division.

A graduate of University of Minnesota in 1943 with B.E.E. degree, Durkee's background includes design and research in equipment such as generators, electronic speed controls, synchronous motor controls, synchronous generator controls, transformers, and special test equipment.

Reilly Opens New Plant For Pipe-Line Tar Products

Reilly Tar & Chemical Corp., Indianapolis, manufacturer of coal-tar products for industry, formally opened a new plant December 4, at Lone Star, Morris County, Texas, for the production of pipe-line enamel, pipe dip tar, roofing pitch, and creosote oil. The new Reilly plant, fifteenth in a network serving the nation, provides the new Lone Star Steel Co., cast-iron pressure pipe plant, which was dedicated in a dual ceremony the same day.

The December 4 dedication program was a stellar event with many high government and industry figures present. Leon H. Keyserling, chairman of the council of Economic Advisers, one of the nation's foremost authorities on the national economy, was an honored guest.

Along with Gov. Allan Shivers of Texas, the governors of New Mexico, Thomas J. Mabry; Oklahoma, Roy J. Turner; Louisiana, Earl K. Long; Arkansas, Sidney S. McMath; and Mississippi, Fielding L. Wright, took part in the ceremonies.

President P. C. Reilly, Jr., and general manager C. B. Edwards of Reilly Tar & Chemical, also participated in the dedication program. Reilly's Lone Star plant manager is George H. Jackson, and sales representative in Dallas is Charles L. Slover.

Rockwell Names Daugherty Manager of Market Research

The appointment of A. C. Daugherty as manager of market research for Rockwell Manufacturing Co. has been announced by W. F. Rockwell, Jr., president. The appointment is effective January 1, 1951.

Daugherty joined Rockwell as a student engineer upon graduation from Penn State. In 1947 he became a market analyst in the company's market-research department.

Daugherty succeeds W. A. Marsteller, who is resigning the first of the year to establish the Marsteller Co., marketing and advertising consultants, in Chicago.

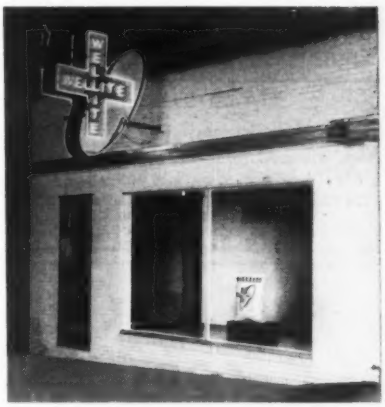
Globe Names Gammeter as Director of Laboratories

Elmer Gammeter has been appointed director of laboratories for Globe Steel Tubes Co., according to an announcement by W. C. Buchanan, president. Gammeter, who has been chief metallurgist at Globe since 1943, is a graduate of Missouri School of Mines and has his master of science and metallurgical engineering degrees from that school.

Prior to his joining Globe, Gammeter was manager of the stainless-steel metallurgical bureau of Carnegie Illinois Steel Co.

Gammeter succeeds the former director of laboratories, Dr. H. K. Ihrig, who has resigned to accept a position with the Allis-Chalmers Co.

Wellite Distributed In Four-State Area



Wellite Corp., a supplier of lightweight additives for drilling fluids and cements, has established its headquarters at Tulsa. The distribution of Wellite is handled by Cardinal Chemical, Inc., of Odessa, Tex. Stock points have been established in Texas, Louisiana, Mississippi, New Mexico, and Oklahoma.

CLASSIFIED ADVERTISING

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

DISPLAY CLASSIFIED
$12.00 a column inch one issue . . .
10% Discount three or more issues.

UNDISPLAYED CLASSIFIED 12c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

EQUIPMENT FOR SALE

USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES, E. A. KELLY, BOX 861, OKLAHOMA CITY. PHONE 5-6407.

WELL equipment. New and used spudders, rotaries, core drills, all sizes and types. Cable tools, drill pipe, bits, pipe. Fishing tools rented. Everything for well service. Pressey & Son, Pueblo, Colo.

BOILERS FOR SALE: 18 Code Oil Field Boilers, 50 to 87 H.P., 100 to 200 Lbs. W.P., Operated Under Hartford into 1948, Not Fired Since. Located on Leases Vicinity Pampa, Texas. Offered Subject to Prior Sale. $500.00 to $700 each, as is, where is. Contact Max Harbison, Kewanee Oil Company, Pampa, Texas.

#45 Star Spudder, Caterpillar Motor, new Kohler Light Plant, Chevrolet Truck, Trailer, complete tools. Rig and equipment in Kansas. Write J. N. Fetzer, 644 Diversey Parkway, Chicago 14, Ill.

FOR SALE: Twin GMC 6-71 Diesel engine 330 HP at 2100 RPM, brand new in original wraps. Full details from McLean Mfg. Co., Inc., 253 Main Ave., Passaic, N. J.

ROTARY Rig (R. L. Cardwell) Draw Works, equipped GAK Waukesha. New 87' L. C. Moore Mast 7¼ x 14 Wheland Pump, Two WAK Waukeshas (one new and one just overhauled), a new 3500 Watt Kohler Light Plant, 17½" National Ideal Rotary Table, B. J. Hook, 3 Sheave Oilwell Block, New 950'—1" Drilling Line, 3500' of New 3½" National Shrink Grip External Upset, Internal Flush 15½# Drill pipe, Simplimatic Brakeout Cathead, Plain Spool or Spinning Line Side, B. J. Tongs, 10¾" and 5½" Casing Tools, Good Doghouse, Core Barrel, 4½" Kelly, 1—6½" Drill Collar. FOB near Olney, Illinois. This unit guaranteed to be in excellent shape; was just recently overhauled. Utility & Industrial Supply Co., 921 E. Michigan Ave., Jackson, Mich. Phone 6194.

FOR SALE

9—230 H.P. Bessemer Type 10 Engines with compressors, Steel Buildings, Valves, and Fittings complete for installation. Located Salem, Illinois Oilfield.

ENGLE PETROLEUM, INCORPORATED
Box 655, Evansville, Indiana
Telephone 5-5179

FOR SALE
600
Fisher Gas Regulators
L. R. KERSHAW
Muskogee, Oklahoma

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: At Oklahoma City, Oklahoma, large stock used air tools reclaimed from modernizing refinery job as follows: Close quarters drills, grinders, chipping and riveting hammers. Other tools, both new and used, including open end and box construction wrenches, etc. Inventory available Cities Service Oil Company, H. D. Patridge, Bartlesville, Oklahoma.

COMPLETE Slimhole Rotary Rig, mounted on Dodge truck, strong Derrick. Ball-bearing throughout, strong, sturdy. 5X10½ mounted mudhog pump, Mission equipped. 10 barrel steel water tank. 700 ft. 12 lb. drill pipe 1500 feet water or oil rig. Money maker, two men operate. $5,500 cash. Box 106, Seminole, Oklahoma.

STAR #83 Spudder, all tools 5" to 10", has drilled only three shallow wells; excellent condition, price $11,000. Contact: John Atha, Grandville, Michigan. Telephone AR 6-2633.

AMPHIBIOUS airplane: Eight place twin-engine Grumman Goose for sale or lease. Formerly owned by large oil company, excellent condition. Richard French, Genesee Airport, R.D. 2, Rochester, New York.

LARGE QUANTITIES
6" #460 Crane Gate Valves
4" & 6" Victualic Couplings
All NEW ready for shipment.
Attractively priced for quick sale.
NEWMAN'S, INC.
Box 1865, Tulsa, Okla.
Phone 4-8188, LD 635

EQUIPMENT FOR SALE

DRILLING rig located at Greggton, Texas, yard, and consisting of complete steam rotary drilling rig without drill pipe, including 2 120 H.P. oil well boilers, 1 6" Union Tool unitized draw works, 1 12x12 Ajax roller bearing steam engine, 1 14½x7½x18 Ideal mud pump, Ideal rotary table, swivel, crown block, traveling block, etc. Contact Rudco Oil & Gas Company, Box 2018, Tyler, Texas.

FOR SALE: Large stock of centrifugal, simplex and duplex steam pumps, steam and gas turbines, Clark, Bessemer & Cooper compressor cylinders in 20" stroke. List available upon request. Cities Service Oil Company, Patridge, Bartlesville, Oklahoma.

FOR SALE: 8 New 20,000 gal. welded tanks. 12—8,000 gal. tank cars. Darien Corp., 60 E. 42nd St., N.Y., N.Y.

SEAMLESS BOILER TUBES

1¼" OD—100,000 ft.
1½" OD—100,000 ft.
2" OD—75,000 ft.
3¼" OD—35,000 ft.
3½" OD—40,000 ft.
5⅝" OD—25,000 ft.

All approximately 9 gauge wall.
Excellent Used Condition.
Single or Double random lengths.

WRITE—WIRE—PHONE

Sonken-Galamba Corp.
2nd and Riverview (X-659)
Kansas City 18, Kansas
THatcher 9243

LINE PIPE FOR SALE

30,000' 2⅜" OD 3.75# & 4# Good Used Lapweld T&C Range 1 Line Pipe
10,000' 6⅝" OD 18.97# Excellent Grade Used Lapweld, Cleaned, Beveled Ends, 20' RML.
4,500' 6⅝" OD 18.97# Strictly No. 1 Electric Weld, 45' Lengths, Plain Ends.
5,000' 6⅝" OD x .188" Wall 12.89# New Spiral Weld, 50' Lengths, Beveled Ends.
4,000' 10¾" OD 34# Good Used Lapweld, P.E., Random Lengths.

CASING & TUBING

20,000' 2⅜" OD 4# Good Used Lapweld Range 1 Tubing with New 10 Round Threads and Collars.
10,000' 5½" OD 10# Recond. Seamless Casing, New 11½ V-Threads and New Collars 5⅛" Long (Recommended for Shallow Wells).
4,500' 7" OD 20# Good Used Lapweld Range 1 T&C Casing, 10 V-Thread.
3,500' 8⅝" OD 25# Good Reconditioned Casing, 8 V-Thd., T&C, Range 1.
3,000' 10¾" OD 35.75# Good Used Lapweld T&C Casing, Range 1, 8 Thread.

OTHER SIZES OF LINE PIPE, SEAMLESS TUBING IN SUITABLE SUBSTITUTE SIZES FOR STANDARD PIPE (EXCELLENT FOR GAS, GATHERING AND FLOW LINES), CASING AND TUBING AVAILABLE FOR IMMEDIATE DELIVERY.

FOR FURTHER INFORMATION, WIRE OR PHONE AT ONCE

A. J. STRUBEL, Broker

SIDney 1791 (Day Phone) HUDson 8152 (Night Phone) . . . 4946 Murdoch, St. Louis, Mo.

EQUIPMENT FOR SALE

3—160 CUBIC FOOT Air Compressors. Diesel: Gasoline. J. C. Morrison, Midwestern Drillers, Liberal, Kansas. Phone 2441.

SUPERIOR COMPRESSORS

2—90 HP Direct Driven, Located Oklahoma City, extra cylinders available. Alfred B. Kern, 223 Wright Bldg., Tulsa, Oklahoma.

FOR SALE: 900′ 3″ line cemented. Number one—75c, and storage tank 8′ x 26′ horizontal, capacity 12,500 gallons, 3/16 plate. Welded. Sets on cradle. Good as new—$500.00. M. J. Regan, Coffeyville, Kans.

1—4′-0″ ID x 40′-6″ x 1¼″ thick Tower. No trays. Tri-State Supply Company, Box 610, Mt. Pleasant, Texas.

4,000 G.P.M. Fluor Atmospheric Cooling Tower. Good condition, bronze hardware. Being released from service due to expansion program. The Derby Oil Company, Box 1030, Wichita, Kansas.

FOR SALE: Westcott, Foxboro and Emco Gas Meters. Geo. R. Milner. Box 124, Okmulgee, Oklahoma.

1—MODEL "E" Fred E. Cooper, Allis-Chalmers double drum winch tractor. 15 mph. road speed. Cross arm spudder, electric starting, 8⅝″ x 7″ OD three sheave single pole mast, dual rear wheels. Would make a good machine for pipe pulling or well service work. Located in Ohio. Write or call Buckeye Supply Co., Zanesville, Ohio.

FOR SALE: 12,500′ used 2⅞″ O.D. seamless upset tubing, 10-thread. P.O. Box 1581, Phone 5-3545, Tulsa, Oklahoma.

Several Army Surplus 4½″ x 6″ Gaso Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN.: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

FOR SALE

DRILLING STEMS: 2¾″, 3″, 3¼″, 3½″, 4″, 4½″, 4¾″ and 5″ in diameter, and from 22 feet to 40 feet long. Used, but in good condition.

HERMAN STRAUSS, INC.
Wheeling, W. Va. Tele. 5170 Wheeling

Reverse Circulating EQUIPMENT FOR SALE

1—5x10 Gardner-Denver Pump
1—Buda 140 H. P. Motor—Unitized and skid mounted
1—Type H Guiberson Circulating Head
1—4 Cyl. Waukesha Circulating motor with 3 speed transmission
1—Brauer 3″ Swivel
1—2″ Kelly
1—3″ Kelly
1—3″ Centrifugal water pump with motor
1—Rotary Hose
1—Pipe rack with pipe and high pressure fittings
1—Lot Miscel. High pressure valves and fittings
1—Steel circulating tank
1—Steel Dog House with miscellaneous equipment.

Motors fired by Gas, Gasoline or Butane

This Reverse Circulating equipment can also be converted for use in shallow rotary drilling.

This equipment has seen but little service and is ready to run.

Price Complete F.O.B. Location Oklahoma City $8500.00

Phone 7-8553—92-9555 Oklahoma City, or write Box D-796, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT WANTED

WANTED: 2500′ of good, used 2⅞″ OD Drill Pipe, 30′ lengths with full-hole tool joints. R. F. Hare, 2018 W. T. Waggoner Bldg., Ft. Worth 2, Texas.

WANTED TO BUY: 2000 feet of 4½″ left-hand drill pipe with tool joints. Texas Water Wells, Inc., 951 McCarty St., Houston, Texas.

HELP WANTED

WANTED: Assistant Plant Superintendent for Natural Gas Plant in vicinity of Alexandria, Louisiana. House and utilities furnished. Box D-802, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST, with the necessary experience to qualify for either District Geologist or special problems geologist in structure and stratigraphy. Headquarters in Shreveport with established producing oil company. Replies confidential. Box D-801, The Oil and Gas Journal, Tulsa, Oklahoma.

SEISMOLOGIST for work in Venezuela. Ten years' experience with four years' interpretive work, family status, salary commensurate with experience and ability. Give full details in reply to The Atlantic Refining Company, P. O. Box 2819, Dallas, Texas.

WANTED: Chemical Engineers for process development and process design on petroleum refining and chemical processes. Prefer individuals with several years' experience in one or both of above fields. Southwest location. Write F. J. Heller, Research and Development Department, Phillips Petroleum Co., Bartlesville, Oklahoma.

DRAFTSMEN

Wanted—Squad leader and draftsmen with experience in Gasoline Plant and Refinery Piping Experience. Please give experience on application.

P.O. Box 29, Corpus Christi, Texas.

MECHANICAL ENGINEER

New large oil pipeline company requires mechanical engineer to handle design, supervise construction, and devise maintenance procedures on all pump station equipment to 5000 HP, not including electric equipment. Station specifically includes 2000 HP maximum IC engine and centrifugal pump. Complete familiarity with high pressure oil piping required. Men under 35 preferred. Include full professional details and minimum salary first letter. Box D-781, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

EXPERIENCED GEOLOGIST—Senior Geologist qualifications. Imagination, good subsurface background; particularly South Texas and Gulf Coast, who desires position with active, aggressive independent company. Location: San Antonio. Replies confidential. Box D-779, The Oil and Gas Journal, Tulsa, Oklahoma.

NATIONALLY known manufacturer has good proposition for men who have retired from oil production or oil refining. No investment required. Write Box D-788, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED accountant, capable of supervising production accounting department of substantial Mid-Western independent company. Submit data and photo. Box D-797, The Oil and Gas Journal, Tulsa, Oklahoma.

ELECTRICAL ENGINEER: New large oil pipeline company requires electrical engineer to handle design, construction and devise maintenance procedures, all classes equipment to 5-KV switch gear. Some familiarity with sub-stations to 110-KV, 5000-KVA desirable but not required. No communications or electronics involved. Include full professional and personal details and minimum salary, first letter. Job is permanent. Box D-761, The Oil and Gas Journal, Tulsa, Oklahoma.

CRUDE Oil Treating Engineer, minimum 2 years' experience, college graduate preferred. Headquarters Oklahoma City, territory covers 10 states. Salary commensurate with experience. State education, background, experience, etc. Reply Sohio Petroleum Co., Industrial Relations, Skirvin Tower, Oklahoma City, Oklahoma.

SALES ENGINEERS
OPERATIONS SUPERVISORS
PERFORATOR OPERATORS

Only Experienced Men Need Apply

WRITE ONLY

WELEX JET SERVICES, INC.
3909 Hemphill Street, Fort Worth 9, Tex.

VALVE DESIGN ENGINEER

With at least ten years of progressive experience in steel valve design including substantial record of achievement in development work to supervise product engineering for established manufacturer of steel valves. Must be thoroughly conversant with specifications governing refinery, oilfield, and industrial valves of all sizes and types. Unusual opportunity for right man. Salary open. Box D-799, The Oil and Gas Journal, Tulsa, Oklahoma.

VACANCIES EXIST WITH MAJOR OIL COMPANY HAVING OPERATIONS IN SEVERAL COUNTRIES IN SOUTH AMERICA FOR:

Chief Reservoir Engineer

Senior Petroleum Engineer

Petroleum Engineering Laboratory Analyst

Wellsite Mud Engineer

Geologists

Micropaleontologists

Salaries offered are dependent upon qualifications and experience and are payable in U. S. currency.

Interested parties should submit essential details of qualifications. All replies, which will be held in the strictest confidence, should be addressed to:

Box D-792

The Oil and Gas Journal, Tulsa, Oklahoma

XUM

HELP WANTED

Graduate Engineers

GOOD OPPORTUNITIES

for

CHEMICAL ENGINEERS: Five to ten years' experience in Chemical Operations or Development. Work in Application of unit operations, evaluations and economic studies leading to cost reduction. Must be graduate, free to travel.

ENGINEERS FOR UNIT OPERATIONS: Five years' experience in the fields of Agitation, Drying or Grinding, Blending and Screening. Specialized knowledge of Heat Transfer, Fluid Flow and Mass transfer are desirable. Must be graduate. Consultation work.

INSTRUMENTATION ENGINEERS: Five or more years of progressively difficult experience in Instrument Research Development or Design. Must have broad and thorough knowledge of instrument theory and application. Should have some knowledge of Chemical Equipment and its operation. Must be graduate.

POWER ENGINEERS: Must have five to fifteen years' experience in some of the following: operating, testing and maintaining power plant equipment, supervising power plant operations, making cost and evaluation studies, heat balance work, power cost accounting, design and layout of power plants, and the selection and installation of power equipment. Must be graduate.

AIR CONDITIONING ENGINEERS: At least 7 years' experience in selection and operation of heating, air-conditioning, ventilating and refrigeration equipment. Well versed in the theory of thermodynamics, fluid flow and heat transfer. For consulting evaluation, and economic operation services. Must be graduate.

MAINTENANCE ENGINEERS: Five to ten years in planning maintenance work, establishing manpower and material requirements, scheduling and controlling work. Must be thoroughly familiar with Machine and Hand Tools used in Plant Maintenance Work. Must have supervised persons doing maintenance work. Must be graduate. For consultation work.

Give experience, education, age, references, personal history, salary received and salary expected. Please be complete and specific.

ALL INQUIRIES WILL BE CONSIDERED PROMPTLY AND KEPT CONFIDENTIAL

E. I. du Pont de Nemours & Co., (Inc.)

ENGINEERING DEPARTMENT PERSONNEL

Wilmington 98, Delaware

HELP WANTED

FOREIGN and Domestic Oil Employment Directory covering the oil industry, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla.

ASSISTANT GEOLOGIST for work in Venezuela on single status, degree in geology plus two years experience with core drill or related work, salary commensurate with experience and ability. Give full details in reply to The Atlantic Refining Company, P. O. Box 2819, Dallas, Texas.

POSITION Available February 1, 1951, Assistant or Associate Professor with Masters degree or higher in Petroleum Engineering to teach reservoir engineering courses in rapidly growing school with excellent laboratory and other facilities. Qualifications will determine salary, but will be comparable to industry. Location Southwest. Box D-765, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER (JUNIOR) with at least 1 year production or drilling experience to work in Venezuela. Single status preferred. Give full details in reply to The Atlantic Refining Company, P. O. Box 2819, Dallas, Texas.

SITUATIONS WANTED

REGISTERED MECHANICAL ENGINEER desires to invest in and assume engineering position with pressure vessel and/or tank fabricator for Tulsa area. Box D-739 The Oil and Gas Journal, Tulsa, Oklahoma

PLANT MANAGER of LUBRICATING GREASE AND OIL PLANT desires connection with progressive oil company. Technical background, extensive experience in plant control and management. Box D-768, The Oil and Gas Journal, Tulsa, Oklahoma.

SUPERINTENDENT-PROCESS supervisor, engineer, experience in complete refinery operations, desires change. Eighteen years experience in distillation, cracking, reforming, polymerization, treating, blending. Proven administration and technical ability. Box D-794, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131, Ph. No. 131, Hobbs, New Mexico.

DRILLING Contractor operating in West Texas and New Mexico desires to contact small or medium-sized independent oil company who needs an operating manager. Personal interview desired. Twenty years experience in all phases of the oil industry. Address replies to Box D-644, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVE ASSISTANT: Specialized Material Control and Purchasing. 20 years' experience in oil business. Available January 1st. E. L. Perry, Jr., Box 831, Borger, Texas.

ENGINEER, 1 year experience petroleum engineering Lab. 2 Years drilling operations. Desires Domestic or Overseas position. Box D-803, The Oil and Gas Journal, Tulsa, Okla.

PURCHASING AGENT—Gas Engineer likes purchasing work and is good at it. Knows inventory, supplies, and materials thoroughly from six years experience in plant and distribution operations. Desires to locate as Purchasing Agent or Assistant with Gas Utility, Pipeline Co., or Oil Co. For past year and one half has been in charge of all purchasing for four Gas Properties. Veteran-Draft Proof—Age 37—State Licensed Technical Engineer. Box D-804, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST

with Ph. D.; experience in all phases commercial geology. Age 42. Location open. If your company is interested in this top geologist, please write

CHAS. J. LOVELESS PERSONNEL SERVICE
508 Mayo Building, Tulsa, Oklahoma

MECHANICAL ENGINEER desires change. 20 years design experience on heavy machinery, including draw works, blocks, pumps. Wants design work on oil country equipment. Box B-798, The Oil and Gas Journal, Tulsa, Oklahoma.

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SPOT CASH PAID FOR PRODUCING ROYALTY. SMALL TO LARGEST BLOCKS IN SETTLED OR OLD PRODUCTION ONLY. Oil Specialists since 1934. GERBER & CO., 120 WALL STREET, NEW YORK, N. Y.

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington New Mexico.

MONTANA ROYALTIES

Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225 Great Falls, Montana.

LEASE AND DRILLING BLOCKS

U. S. LANDS in Colorado can be filed for Government oil lease in developing area. Good opportunity. Small Expense. Write S. W. Pressey, Pueblo, Colorado.

FOR SALE: OIL LEASE; 160 acres. Average daily production 15 bbls. On water flood. Write Albert Vincent, 310 So. Silver St., Paola, Kansas, or call 384w.

TRADE: Casing and tubing for ground floor interest in proven or semi-proven production. Principals only, send full details to Box D-800, The Oil and Gas Journal, Tulsa, Okla.

240 ACRES. $5000 dry hole money available for a well to the Prue sand. Highly defined Geological Structure. 17-15-5 Lincoln County. 1115 South Canton, Tulsa. Phone 9-5207.

LEASES ROYALTIES

Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited

B. D. BUCKLEY
6635 Delmar Ave., St. Louis 5, Mo.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

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Nickel plate $4.00
Gold plate $4.50

Lots of 12 or more $1.00 less per bit. Check, Money Order or C.O.D.

H. McGAUGHEY
P.O. Box 11063, Houston, Texas

North Central Texas

(Continued from page 144)

Garrett, Sec. 1, BAL Sur., adjoining Albany, dry, TD 655 ft. in sand.

Stonewall County: Atlantic Refining Co. 1 Mary L. Wilson, 83-F-H&TC, 14 mi. N Aspermont, dry, TD 6,405 ft., elev. 1,728 ft., Strawn lime 5,445 ft., Mississippian 6,110 ft., Ellenburger 6,375 ft.

Throckmorton County: Bridwell Oil Co. 2 R. P. Lee, Sec. 198, BBB&C Sur., 5½ mi. SW Throckmorton, dry, TD 4,200 ft.

Jones & Stasney 1 M. B. Gentry Heirs, Sec. 73, CIR Sur., 10 mi. SW Throckmorton, dry, TD 4,765 ft.

Fred M. Manning, Inc. 1 H. C. Manning-Graham "D," TE&L Sur., 3 mi. NE Woodson, dry, TD 3,982 ft., Caddo 3,972 ft.

Warren Oil Corp. 1 C. W. Wiley, Sec. 2,211, TE&L Sur., 4 mi. E Woodson, dry, TD 4,805 ft., Caddo 3,865 ft., Mississippian 4,690 ft.

Wichita County: W. A. Loftin 1-A Roy Carnes, Red River Valley Lands, 3 mi. S Burkburnett, dry, TD 616 ft.

Frank Wood 1 Allison-Boone, Wm. Mayer Sur., 3½ mi. W Wichita Falls, dry, TD 5,430 ft., Caddo 5,137 ft.

Young County: Burk Royalty 1 G. P. Stewart, A-1,284, Young CSL, 1 mi. S Markley, dry, TD 4,010 ft.

L. T. Burns 1 J. P. Dunagan "B," Sec. 163, TE&L Sur., 2 mi. N Orth, dry, TD 5,022 ft.

Neeld & Hood Drilling Co. 1 O. Williams, Sec. 3,401, TE&L Sur., 4 mi. SE Olney, dry, TD 764 ft.

Warren Oil Corp. 1 K. Deats, D. W. Russell Sur., 4 mi. NW Eliasville, dry, TD 4,375 ft., elev. 1,236 ft., Caddo 3,522 ft., conglomerate 4,277 ft., Marble Falls 4,332 ft.

Permian Basin

(Continued from page 152)

field, in 32-16s-37e, had prospects of production from the Tubb sand of the Permian.

A 4-hour drill-stem test from 7,852-98 ft. recovered 120 ft. of oil and gas-cut mud, said to be about 10 per cent oil, plus 30 ft. of heavily oil and gas-cut mud estimated to be 50 per cent oil. It was drilled ahead to 7,935 ft. and tested 4 hours with packer at 7,898 ft.

A good blow of air was maintained throughout the period and recovery was 90 ft. of heavily oil and gas-cut mud, plus 10 ft. of clean oil. It was to core ahead. Top of the sand was 7,730 ft., and minus 3,931 ft., which was high to the same marker in the Knowles field.

Amerada Petroleum Corp. 2 Caudle, northwest outpost to Bagley-Hightower Pennsylvanian field, had additional pay in the Pennsylvanian. A drill-stem test, open 5 hours and 50 minutes from 9,764-9,830 ft. had gas at the surface in 6 minutes, mud and distillate in 1 hour and 50 minutes, flowing through ⅝-in. choke on bottom and 1-in. on top. A total of 8.28 bbl. of distillate was recovered during the 4-hour flow.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Chaves County: Honolulu Oil Corp. 1 Levick-State, 16-10s-27e, dry, TD 7,215 ft., elev. 3,861 ft., San Andres 1,490 ft., Glorietta 2,690 ft., Abo 4,970 ft., Siluro-Devonian 6,785 ft., pre-Cambrian 7,198 ft.

Magnolia Petroleum Co. 1 State "Z," 36-7s-29e, Lightcap outpost, dry, TD 8,731 ft., elev. 4,186 ft., Mississippian 7,935 ft., Devonian 8,383 ft., Ellenburger 8,620 ft., pre-Cambrian 8,723 ft.

Curry County: Slick-Moorman 1 Daugherty, 4-5n-35e, dry, TD 6,860 ft., elev. 4,426 ft., San Andres 2,800 ft., Yates 3,960 ft., Abo 5,000 ft., Woolcamp 6,350 ft.

Lea County: Atlantic Refining Co. 1 State "Q," 2-19s-35e, dry, TD 6,200 ft., elev. 3,824 ft., Yates 3,320 ft., Queen 4,490 ft., Delaware sand 5,865 ft.

ADVERTISERS

Air Reduction Sales Co. 29
Allen's Foundry & Machine Works 139
American Cable Division of American Chain & Cable Co., Inc. Inside Back Cover
American Locomotive Company 168
American Steel & Wire Co. 11
Ansul Chemical Co. 125
Automatic Electric Co. 155
Axelson Manufacturing Company 40
Baash-Ross Tool Company 83
Baird Mfg. Co. 144
Baker Oil Tools, Inc. 141, 144
Bethlehem Steel Co. 160
Bettis Corporation 131
Boyd Co., Clarence L. 119
Boyles Galvanizing Company 147
Buffalo Forge Company 28
Cameron Iron Works, Inc. 91
Cannon Electric Development Company 135
Carnegie-Illinois Steel Corporation 12, 13
Cast Iron Pipe Research Association 119
Chicago & Southern Air Lines 154
Chicago Bridge & Iron Company 65
Chrysler Corporation, Industrial Engine Division 25
Clark Bros. Well Servicing Co. 146
Classified Advertising 164, 165, 166
Dean Brothers Pumps, Inc. 131
De Laval Steam Turbine Co. 18
Dow Chemical Co., The 42
Drilling & Service, Inc. 152
Duff-Norton Mfg. Co., The 41
du Pont 1
Emsco Derrick & Equipment Co. 81
Enardo Manufacturing Co. 135
Ethyl Corporation 8, 9
Fairbanks-Morse & Co. 2
Falstrom Company 131
Flint Steel Corporation 143
Fluor Corporation, Ltd., The 93
Four Wheel Drive Auto Co., The 44
Foxboro Company, The 10
General American Transportation Corporation 46
General Electric Company 32
General Electric Co., Electronics Dept. 99
Globe Oil Tools Company 132
Globe Steel Tubes Co. 33
Grancell, I. H. 134
Great Lakes Carbon Corp. 142
Gunite Concrete & Construction Co. 130
Harper Company, H. M. 16
Helicoid Gage Division, American Chain & Cable Co. 96
Hinderliter Tool Co., Div., H. K. Porter Company, Inc. 133
Hudson Engineering Corporation 85
Huey & Co., S. E. 118
Hughes Tool Co. Back Cover
Inferno Co., The 128, 130, 142, 150
International Harvester Co. 73
International Nickel Company, Inc. The 48
Jewel Manufacturing Company 117
Johns-Manville Corporation 151
Johnston & Jennings Company, The, Division of Pettibone Mulliken Corporation 105
Jones & Laughlin Supply Co. 22
Kellogg Co., The M. W. 110
Kerotest Manufacturing Co. 43
Kinzbach Tool Co., Inc. 45
Koch Engineering Company, Inc., The 129
Lane-Wells Company 74
Layne & Bowler, Inc. 14
Levingston Shipbuilding Co. 38
Linea Aeropostal Venezolana 150
Link-Belt Company 5
Macwhyte Co. 3
Magnet Cove Barium Corp. 4
Marley Company, Inc., The 7
Mayo Hotel, The 150
McKissick Products Corporation 86
McNamar Boiler & Tank Co. 103
Minneapolis-Honeywell Regulator Co., Industrial Division 120
Minneapolis-Moline 135
Monsanto Chemical Company 19
Murdock Tank & Mfg. Co. 146
Murphy, Frank W. 142
Natasco Co. 145
National Airoil Burner Co., The 130
National Geophysical Company, Inc. 136
National Supply Co., The 26
National Tube Company 27
Nelson Electric Supply Co. 146
Newport News Shipbuilding and Drydock Company 106
Nicholson & Co., W. H. 130
Norris Brothers, Inc. 119
Oakite Products, Inc. 104
Ohio Injector Company 15
Oil Center Tool Co. 140
Oklahoma Contracting Corporation 121
Orbit Valve Company 116
Parkersburg Rig & Reel Co. 126
Pearless Pump Division of Food Machinery & Chemical Corporation 153
Penberthy Injector Co. 122, 128
Perrault Brothers 117
Petroleum Electric Power Assn. 30
Pipeline Cleaners Co. 118
Pipe Line Service Corp. 123
Pyrene Manufacturing Company 148
Radio Corporation of America 17
Reading-Pratt & Cady Division of American Chain & Cable Co. 94
Rector Well Equipment Co., Inc. 134
Reed Roller Bit Company 88
Republic Steel Corporation 37
Roebling's Sons Company, John A. 39
Ross Heater & Mfg. Co., Inc. 20
Schlumberger Well Surveying Corp. 31
South Texas National Bank 122
Standard Oil Co. of California 24
Standard Pressed Steel Co. 150
Standco Brake Lining Co. 134
Steel Forgings, Inc. 118
Taylor Forge & Pipe Works 112
Templeton, Kenly & Co. 134
Texas Company, The 34
Thornhill-Craver Co. 35
Timken Roller Bearing Company, Steel & Tube Division 21
Titanium Alloy Mfg. Division National Lead Company 149
Torrington Company, The 23
Trans-Texas Airways 118
Tretolite Company Front Cover
Trojan Construction Co., Inc. 122
U. S. Steel Corp. Subsidiaries 11, 12, 13, 27
Universal Oil Products Co. 130
Van Cleef & Arpels 100, 146
Vegetable Oil Products Company, Inc. 6
Venezuelan Airlines, The 150
Vick & Sons, E. W. 134
Viking Pump Co. 141
Vinson Supply Co. 87
Visco Products Co., Inc. 70
Wales Trucking Co. 118
Warren Petroleum Corporation 50
Whitmor Homebuilders, Inc. 98
Williamson, Inc., T. D. 124
Worthington Pump & Machinery Corp., Engine Division 36
Wyatt Metal & Boiler Works Inside Front Cover

CALENDAR OF EVENTS

The Calendar of Events will be found on page 42 of this issue, immediately following the feature "They Say."

Louisiana-Arkansas

(Continued from page 154)

NORTH LOUISIANA WILDCAT FAILURES

Caddo Parish: J. D. Holloway 1 I. K. Prescott, dry, TD 2,866 ft., elev. 217 ft., Nacatoch 949 ft., Blossom 1,980 ft., Paluxy 3,434 ft.

DeSoto Parish: E. C. Laster 2 Perkins-McLaurin, 25-15n-14w, dry, TD 4,004 ft., elev. 244 ft.

Grant Parish: Halsey, Stewart & Stewart 1 Southern Kraft Corp., 11-7n-3w, dry, TD 5,140 ft., elev. 110 ft.

ARKANSAS WILDCAT FAILURE

Columbia County: E. G. Bradham 1 Huffmon, NW SE 6-17s-21w, dry, TD 8,246 ft., elev. 353 ft., Tokio 2,938 ft., massive anhydrite 3,679-3,830 ft., James 4,352-4,424 ft., Sligo 4,622 ft., Pettit 4,690 ft., Travis Peak 4,752 ft., Cotton Valley 5,922 ft., Buckner 7,888 ft.

TABLE OF CONTENTS ON PAGE 49

QUICK INSTALLATION

is the pay-off with ALCO AIRCOOLERS

Installation is fast with ALCO **Aircoolers.** You need no high-cost, specialized labor. Clear, easy-to-understand instructions tell exactly what to do. Every part is marked by number. A check-off list tabulates all the material and is easy to read. Assembly drawings are complete to the last detail. Everything has been designed to make installation quick, simple, and easy.

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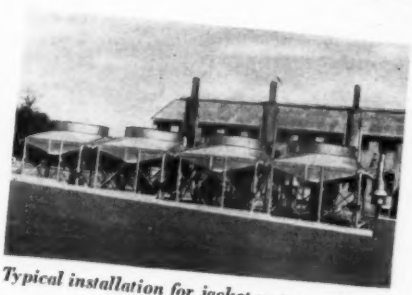
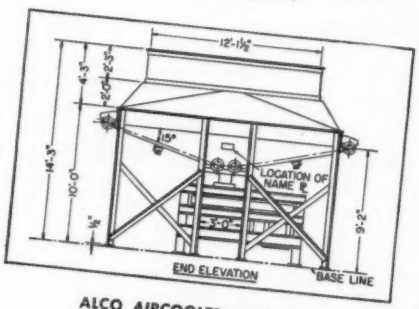
ONE AIRCOOLER FROM THE ALCO LINE



Typical installation for jacket-water cooling at a Southern plant.



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Surface External—10,880 sq. ft. Style T-5 (Water Core)
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1,386 sq. ft. Style T-1
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